Operating Instruction Manual

Generic Slave DTM for SERCOS III Slave Devices

Configuration of SERCOS III Slave Devices

Beta Version

Language: English

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1 Introduction

1.1 About this Manual

This manual describes how to configure SERCOS III Slave devices, which are described with SDDML files. These devices can be configured by use of the Generic SERCOS III Slave DTM within an FDT Framework.

Descriptions of the Dialog Panes

The table below gives an overview for the individual dialog panes descriptions:

Section	Subsection	Manual Page
Configuration	*General*	*21*
	Electronic Label	*22*
	FSP IO	*22*
	FSP Drive	*22*
Device Description	*About Description*	*50*
	SDDML	*51*

Table 1: Descriptions Dialog Panes

1.1.1 Online Help

The generic SERCOS III Slave DTM contains an integrated online help facility.

- To open the online help, click on the **Help** button or press the **F1** key.

1.1.2 List of Revisions

Index	Date	Version	Component	Chapter	Revision
1	2009-03-30	0.900.x.x 0.900.x.x	SIIIGenericSlaveDTM.dll SIIIGenericSlaveGUI.ocx	all	Created

1.1.3 Conventions in this Manual

Operating Instructions, a result of an operation step or notes are marked as follows:

Operating Instructions:

➢ <instruction>

or

1. <instruction>
2. <instruction>

Results:

➮ <result>

Notes:

Important: <important note>

Note: <note>

<note were to find further information>

1.2 Legal Notes

1.2.1 Copyright

1.2.2 Important Notes

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1.2.6 Registered Trademarks

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SERCOS interface® is a trademark of SERCOS International e. V., Suessen, Germany.

All other mentioned trademarks are property of their respective legal owners.

1.3 About Generic SERCOS III Slave DTM

You can use the Generic SERCOS III Slave DTM to configure SERCOS III Slave described with SDDML files within a FDT Framework.

The informations necessary for the configuration of the SERCOS III Slave devices are stored within the SERCOS III Master device when using the SERCOS III Generic Slave DTM and thus the Master is configured.

1.3.1 Requirements

System Requirements

- Windows® 2000/ Windows® XP
- CD ROM drive
- Graphic resolution: min. 1024 x 768 pixel
- Keyboard and Mouse

Requirements Generic SERCOS Slave DTM

Requirements for working with a generic SERCOS III Device DTM are:

- Installed FDT/DTM V 1.2 compliant frame application
- Installed SERCOS Master DTM
- SDDML files of the devices to be configured
- The DTM must be loaded to the device catalog.

Loading SDDML Files

To work with the Generic SERCOS III Device DTM, the SDDML file of the device must be present in the SDDML folder in the installation directory of the DTM.

1.4 Dialog Structure of the Generic SERCOS III Slave DTM

The graphical user interface of the DTM is composed of different areas and elements listed hereafter:

1. A header area containing the **General Device Information**,
2. The **Navigation Area** (area on the left side),
3. The **Dialog Pane** (main area on the right side),
4. The general buttons **OK**, **Cancel**, **Apply**, **Help**,
5. The **Status Line** containing information e. g. the online-state of the utility.

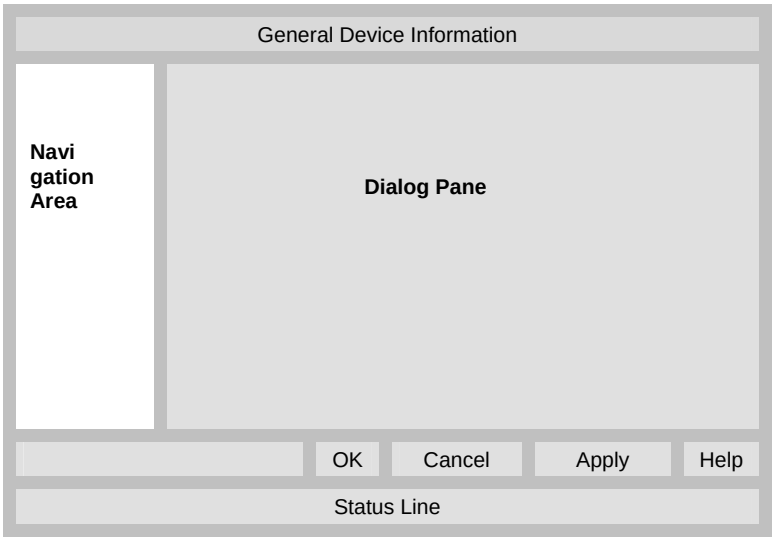


Figure 1: Dialog Structure of NETX SERCOS Master DTM

1.4.1 General Device Information

Parameter	Meaning
IO Device	Name of the device
Vendor	Vendor name of the device
Device ID	Identification number of the device
Vendor ID	Identification number of the vendor

Table 2: General Device Information

1.4.2 Navigation Area

The **Navigation Area** at the left side of the dialog provides a tree structure to navigate through the dialog panes of the DTM.

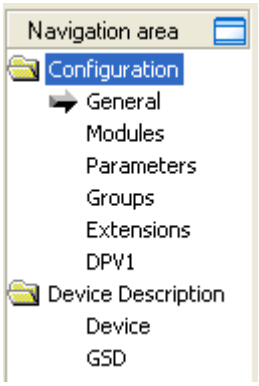


Figure 2: Navigation Area

➢ To access a DTM dialog pane select the respective item of the navigation tree structure.

Hide / display Navigation

The **Navigation Area** can be hidden or it can be displayed again.

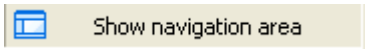
Control	Meaning
	Window button to hide the navigation area, (at the right side of the navigation title bar).
	**Show navigation area** button to open the navigation area, (at the lower left corner of the dialog pane).

Table 3: Hide / display Navigation

1.4.3 Dialog Panes

Configuration	
General	At the pane **General** the actual **Station Address** of the Slave device is displayed and can be changed if necessary. Further information to this you find in section *General* on page *21*.
Electronic Label	At the **Electronic Label** pane all information about the device which has been stored in the electronic label can be displayed. More information on this topic is available in section *Electronic Label* on page 22 .
FSP IO	The **FSP IO** pane allows it to change the parameter settings of the modules. This window is only present if supported by the device profile. You find a detailed description in section *FSP IO* on page 24.
FSP Drive	At the **FSP Drive** pane you can access inputs and outputs. This window is only present if supported by the device profile. It is described in detail in section *FSP Drive* on page 41.
Device Description	
SDDML	By use of the **SDDML-Viewer** an SDDML file can be searched through. Further information on this you find in section *SDDML* on page 51.

Table 4: Overview Dialog Panes

Note: Accessing the **Diagnosis** panes of the Generic SERCOS III Slave DTM requires an online connection from the SERCOS III Slave DTM to the SERCOS III Master DTM.

For further information on setting up an online connection, please refer to section *Connecting/Disconnecting Device* on page 54.

1.4.4 Controls and Dialog Buttons

In this section, you will find general information on controls and buttons.

1.4.4.1 General Buttons

The table below explains the general buttons in the DTM user interface.

Button	Meaning
OK	To confirm your latest settings, click on the **OK** button. All changed values will be applied on the frame application database. *The dialog then closes.*
Cancel	To cancel your latest changes, click on the **Cancel** button. Answer to the safety query **Configuration data has been changed. Do you want to save the data?** by **Yes**, **No** or **Cancel**. **Yes**: The changes are saved or the changed values are applied on the frame application database. *The dialog then closes.* **No**: The changes are not saved or the changed values are not applied on the frame application database. *The dialog then closes.* **Cancel**: *Back to the DTM.*
Apply	To confirm your latest settings, click on the **Apply** button. All changed values will be applied on the frame application database. *The dialog remains opened.*
Help	To open the DTM online help, click on the **Help** button.

Table 5: General Buttons

1.4.4.2 Table Line Buttons

- To select, create or delete a line in a table use the buttons shown in the table below.

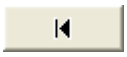
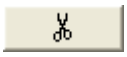
Button	Meaning
	To select the first line of a table use the button **First Line**.
	To select the previous line of a table use the button **Previous Line**.
	To select the next line of a table use the button **Next Line**.
	To select the last line of a table use the button **Last Line**.
	The button **Create a new Line** inserts new lines into the table.
	The button **Delete selected Line** deletes the selected line from the table.

Table 6: Table Line – Buttons

1.4.5 Status Bar

The **Status Bar** displays information about the current state of the DTM. The current activity e.g. download is signaled graphically via icons in the status bar.

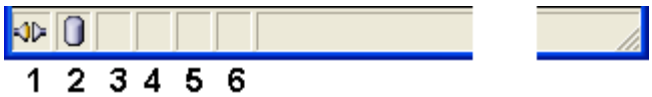


Figure 3: Status Bar – Status Fields 1 to 6

Status Field	Icon / Meaning
1	**DTM Connection States**
	Connecting: Icon going closed = Device is going online
	Connected: Icon closed = Device is online
	Disconnecting: Icon going opened = Device is going offline
	Disconnected: Icon opened = Device is offline
	Disconnected – disturbed: Icon with lightening = Device communication disturbed
2	**Data Source States**
	Data set: The displayed data are read out from the instance data set (database).
	Data set locked: The displayed data are read out from the instance data set (database). Database is locked with password.
	Device: The displayed data are read out from the device.
	Device locked: The displayed data are read out from the device. Device is locked with password.
3	**States of the instance Date Set**
	- **All data loaded**
	Valid Modified: Parameter is changed (not equal to data source).
	Invalid Modified: Invalid value (e. g. not plausible).
	- **Initial data set**: Parameter value is equal to data source value (data base or field device).
4	**Changes directly made on the Device**
	Changes have only an impact on the device and not on the instance data set. Instance data set and the device may not be consistent any more.
	Load/configure diagnosis parameters: Diagnosis is activated.
5	**Direct Mode active**
	Direct Mode active

More see next page

Status Field	Icon / Meaning	
6	**Device Diagnosis Status**	
		**Device Failure**: Incorrect communication due to malfunction in the field device or its peripherals.
		**Maintenance required**: Although the communication is error-free, the wear reserve is nearly exhausted or a function will soon be restricted due to operational conditions.
		**Off-specification**: The device is operating outside its specified range or internal diagnosis indicates deviations from measured or set values due to internal problems in the device or process characteristics.
		**Device OK**: Communication is error-free.
		**Functional Check**: Communication temporarily incorrect (e.g. frozen) due to on-going work on the device.
		Diagnosis deactivated

Table 7: Status Bar Icons [1]

2 Getting Started

2.1 Configuration Steps

The following table describes the steps to configure a device with the Generic SERCOS III Slave DTM as it is typical for many cases. At this time it is assumed that the SERCOS III Master DTM installation was already done.

#	Step	Short Description	For detailed information see section	Page
1	Add SERCOS Slave in the Device Catalog	Add the Slave in the Device Catalog by importing the device description file to the Device Catalog. Depending of the FDT Container. For netDevice: - **Network > Import Device Descriptions**.	*(See User Manual netDevice and netProject)*	-
2	Load device catalog	Depending of the FDT Container. For netDevice: - select **Network > Device Catalog**, - select button **Reload Catalog**.	*(See User Manual netDevice and netProject)*	-
3	Create new project / Open existing project	Depending of the frame application. For the configuration software: - select **File > New** or **File > Open**.	*(See User Manual of the Frame Application)*	-
4	Insert Master or Slave into configuration	Depending of the FDT Container: For netDevice: - in the Device Catalog click to the Controller, - and insert the device via drag and drop **to the line** in the network view, - in the Device Catalog click to the Slave, - and insert the device via drag and drop **to the Controller bus line** in the network view.	-	-
5	Configure Slave	Configure the Slave device. - Select the device icon of the Slave.and select entry **Configuration** in context menu - The Slave DTM configuration dialog is displayed. In the Slave DTM configuration dialog: - select **Configuration >General**, - set the Watchdog control and Interval, - select **Configuration >Electronic Label**, - check the device-specific information, - select **Configuration >FSP IO**, - set the module Parameters, - Select **Configuration >FSP Drive**, - perform detailed parameterization, - close the Slave DTM configuration dialog via the button **OK**.	*Configuring Slave Parameter* *General* *Electronic Label* *FSP IO* *FSP Drive*	*18* *21* *22* *24* *41*
6	Configuration Steps Master device	Configure the Master device via SERCOS Master DTM.	*(See User Manual DTM for SERCOS III Master devices)*	-
7	Save project	Depending of the frame application. For the configuration software: - select **File > Save**.	*(See User Manual of the Frame Application)*	-

Table 8: Getting Started - Configuration Steps

For information to further steps as **Diagnosis**, refer to the user manual *DTM for SERCOS Master devices*.

2.1.1 Configuring Slave Parameters

The following steps are needed to set the Slave device parameters using the SERCOS III Slave DTM:

o Set the Watchdog control and Interval:

➢ Select **Configuration > General** in the navigation area.

o Check device specific information about the Slave:

➢ Select **Configuration > Electronic Label** in the navigation area.

o Set some essential parameters for FSP IO devices:

➢ Select **Configuration > FSP IO** in the navigation area.

➢ Set some essential parameters for FSP drives:

➢ Select **Configuration > FSP Drive** in the navigation area.

For more information refer to section *General* on page *21*, to section *Electronic Label* on page *22*, to section *FSP IO* on page 24 and to section *FSP Drive* on page 41.

3 Configuration

3.1 Overview Configuration

Dialog Panes "Configuration"

The table below gives an overview for the **Configuration** dialog panes descriptions:

Section	Subsection	Page
Configuration	*General*	*21*
	Electronic Label	*22*
	FSP IO	*24*
	IO Modules	*25*
	User-defined Parameters	*33*
	Process Data	*39*
	FSP Drive	*41*
	Drive Connections	*41*
	User-defined Parameters	*45*

Table 9: Dialog Panes Configuration

There are two kinds of SERCOS III modules which can be configured by SERCOS III Generic Slave DTM, namely

- FSP IO modules according to specification "*Function Specific Profile IO V1.1.1.1*", see reference 7
- FSP Drive modules according to specification "*Function specific profile Drives V1.1.2.11*", see reference 8

There may also be hybrid modules which belong both to FSP IO and to FSP Drive categories.

For FSP IO modules, the **Configuration** dialog pane looks like:

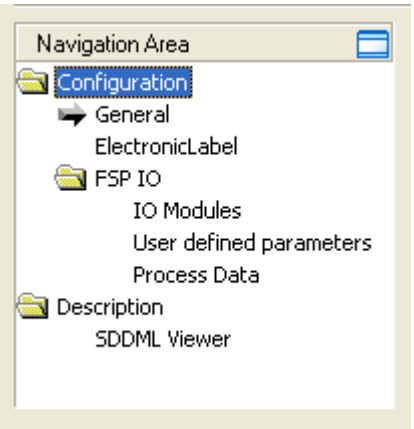


Figure 4: Navigation Area - Configuration for FSP IO Modules

For FSP Drive modules, the **Configuration** dialog pane appears like:

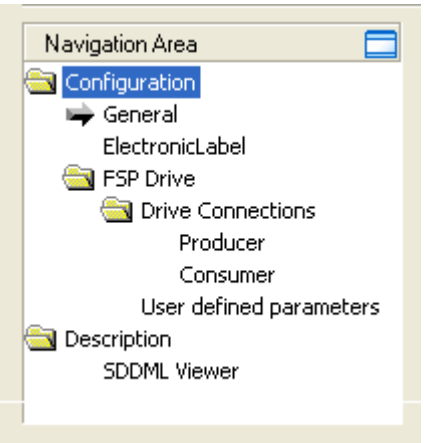


Figure 5: Navigation Area - Configuration for FSP Drive Modules

3.2 General

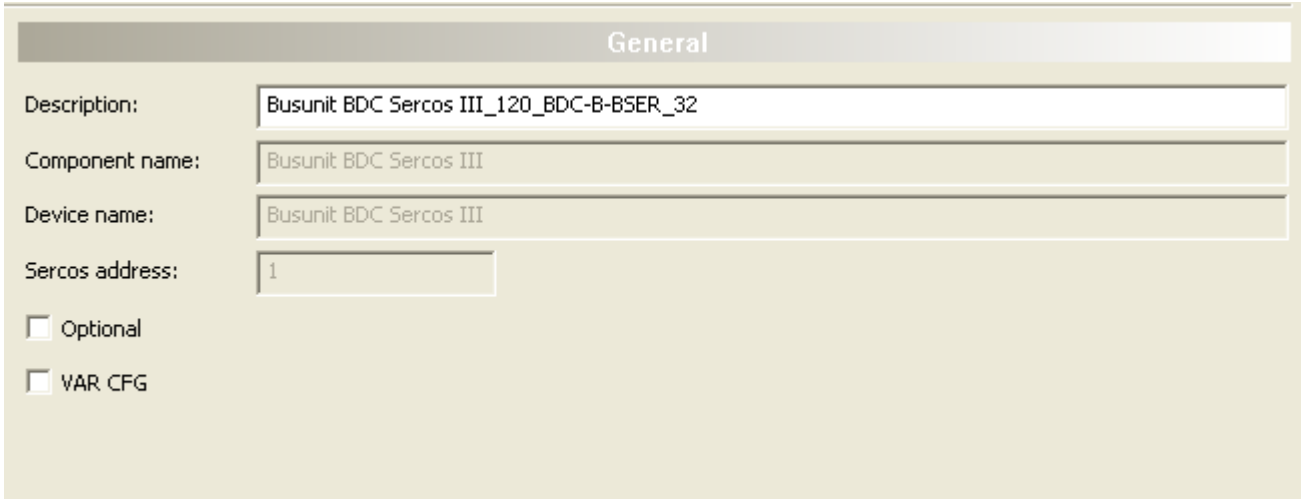


Figure 6: Configuration > General

The menu entry **Configuration > General** is available at all SERCOS III Generic Slave modules independently of being a FSP IO or FSP Drive module.

The following items are displayed:

Name	Meaning
Description	Contains a description of the device
Component name	Contains the name of the component
Device name	Contains the name of the device
SERCOS address	Contains the SERCOS address

Table 10: Configuration > General

The following checkboxes are present:

Optional:

indicates that the item is optional and may be omitted.

VAR_CFG:

indicates that variable configuration is allowed (i.e. the user may at least partly change the configuration originating from the SDDML file of the device.

3.3 Electronic Label

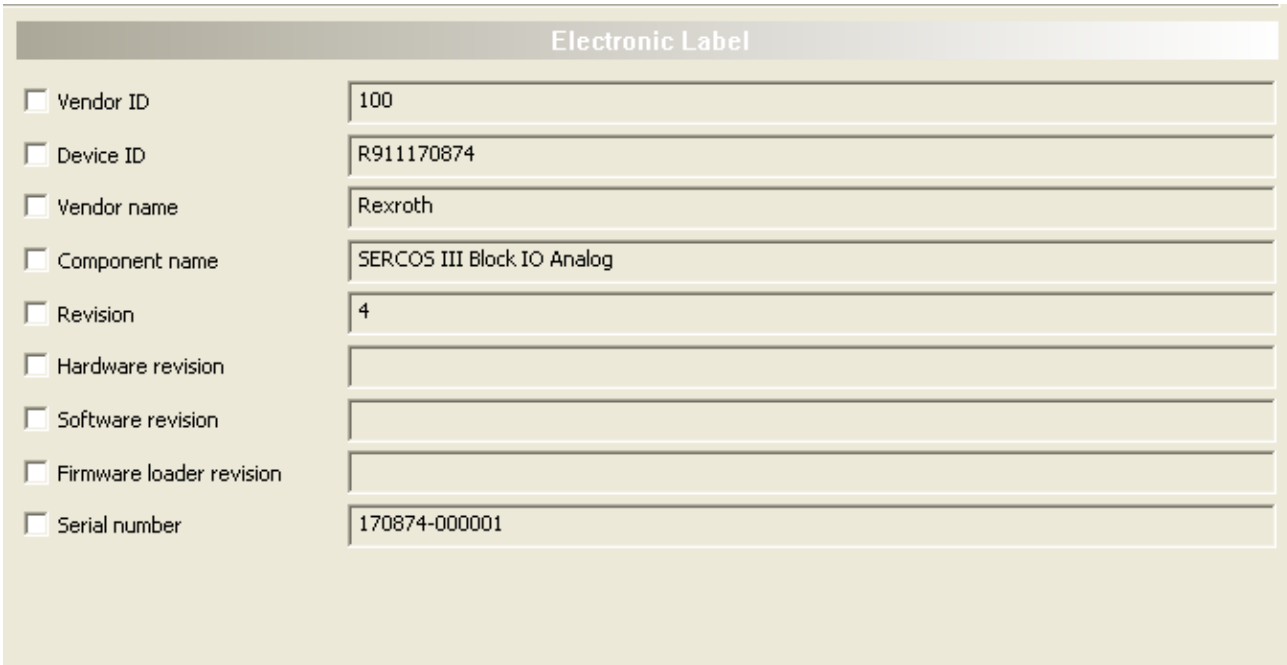


Figure 7: Configuration > Electronic Labell

The menu entry **Configuration > Electronic Label** is available at all SERCOS III Generic Slave modules independently of being a FSP IO or FSP Drive module. It reflects the “Electronic Label” of the SERCOS III device as defined in IDN S-0-1300 according to the SERCOS III specification.

The following items are displayed:

Name	Meaning
Vendor ID	Vendor Code as defined in IDN S-0-1300.x.03
Device ID	Device ID as defined in IDN S-0-1300.x.05
Vendor name	Vendor name as defined in IDN S-0-1300.x.02
Component name	Component name as defined in IDN S-0-1300.x.01
Revision	Revision as defined in IDN S-0-1300.x.07
Hardware revision	Hardware revision as defined in IDN S-0-1300.x.08
Software revision	Software revision as defined in IDN S-0-1300.x.09
Firmware loader revision	Firmware loader revision as defined in IDN S-0-1300.x.10
Serial number	Serial number as defined in IDN S-0-1300.x.12

Table 11: Configuration > Electronic Label

For each item an associated check button can be checked (located at the most left part of the window):

If this button is checked, the master will check this item for correctness, otherwise the master will assume the correctness without performing a check.

- The Vendor ID is a 16 bit wide unique code introduced for identification of devices within the SERCOS network.

- If the value differs from 0, the device comes from a registered vendor which has been assigned to that code by SERCOS International.
- If the value is 0, the device comes from an unregistered vendor.
- The Device ID is a unique code managed by the vendor for separating the various types of devices the vendor offers.
- The component name contains the name of the device as it would for instance be published in vendors price list.
- The revision is an integer numeric value (16 bit) which should be incremented each time when there is a significant change in the function of the device (i.e. a functional correction of the device).
- The hardware revision identifies the version number of the hardware of the device. This value is specified by the manufacturer.
- The software revision identifies the version number of the software or firmware of the device. This value is specified by the manufacturer.
- The firmware loader revision identifies the version number of the firmware loader which may be contained in the device. This value is specified by the manufacturer.
- The serial number. It identifies the unique number of the individual device which has been assigned to the device at the manufacturer.

3.4 FSP IO

3.4.1 Introduction

In SERCOS III there are three kinds of IO devices according to the FSP IO specification (reference [7]):

- Compact IO Devices
- Modular IO Devices
- Hybrid IO Devices

A compact IO device contains one or more fixed IO functions, for instance a 16 bit digital input module could be considered to be a compact IO device. It is not structured into separate modules.

A modular IO device contains a complex or variable configurable device which is structured into separate modules.

A hybrid IO device combines an IO device with a drive.

A function group within a SERCOS III IO device is defined as a group of identical IO functions, such as a 16 bit digital input module or 4 bit analog output module. A function group is usually denominated like the associated IDN, see list below.

Example of a Compact IO Device

For example, a compact device may contain 16 digital Outputs according to FG S-0-1502 and 16 digital Inputs according to FG S-0-1503. So the bus head includes the function groups FG S-0-1500, FG S-0-1502 and FG S-0-1503.

Example of a Modular IO Device

For example, a modular device may contain

Module 1: 8 digital Outputs according to FG S-0-1502

Module 2: 16 digital Outputs according to FG S-0-1502

Module 3: 4 analog Inputs according to FG S-0-1505 and 4 analog outputs according to FG S-0-1504.

Module 4: 16 digital Inputs according to FG S-0-1503.

So the bus head includes exactly one function groups FG S-0-1500 and there are four modules with together 5 function groups. Module 3 contains 2 function groups (FG S-0-1505 and FG S-0-1504) while all other modules contain only one single function group (Module 1 and module 2: FG S-0-1502, Module 4: FG S-0-1503)

3.4.2 IO Modules

At the pane **IO Modules** compact or modular devices can be configured.

For instance, the figure displays the configuration of a compact device consisting of digital output and digital input.

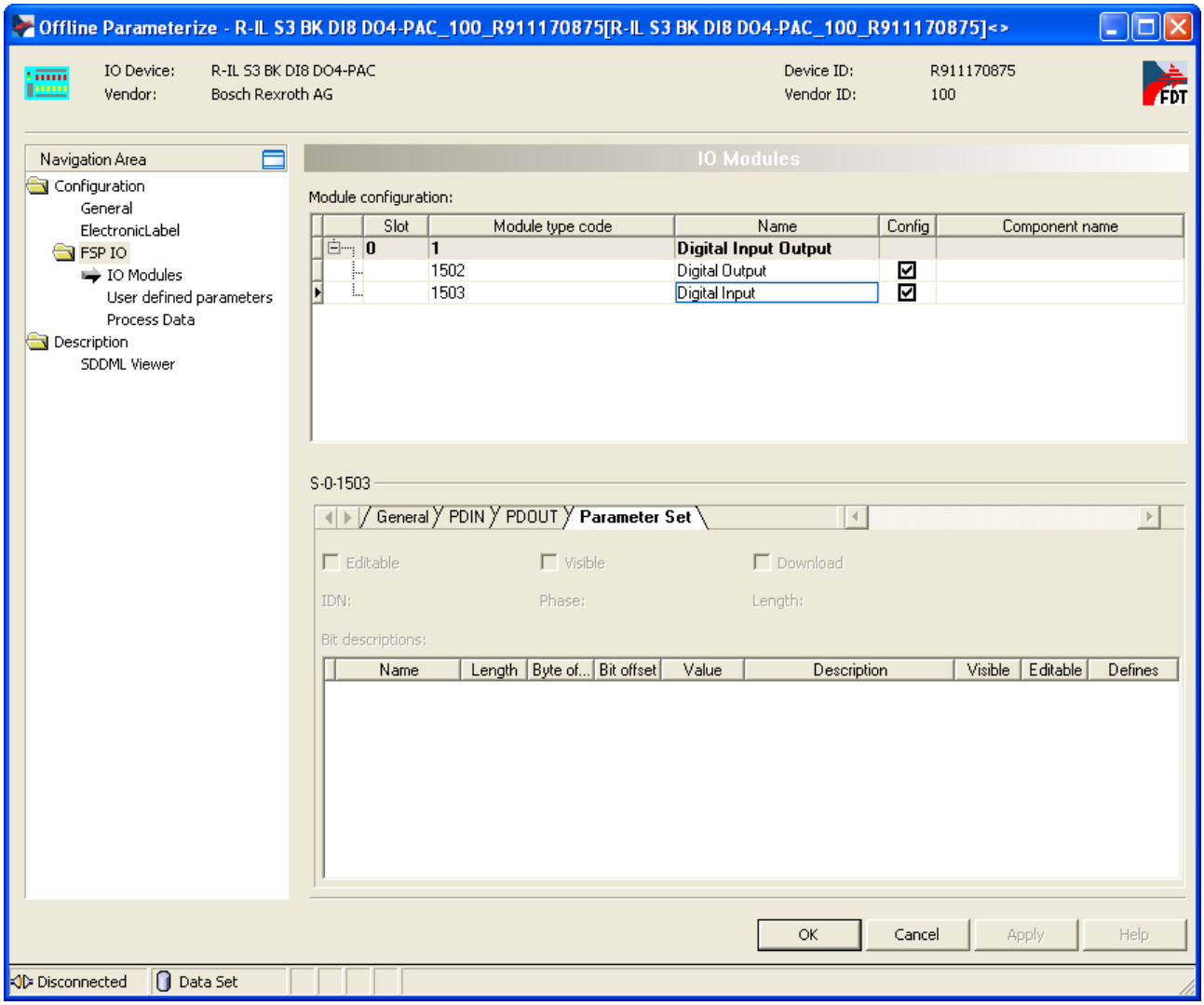


Figure 8: IO Modules Pane

The upper part of the screen contains the module table, see section *Module Configuration* Table.

The contents of the lower part of the screen is a card register whose contents depends on:

- The module selected in the upper part of the screen (in example: Digital Input IDN S-0-1503).
- The selected card of the card register

There are four register cards available:

- Register Card ‘General’
- Register Card ‘PDIN’
- Register Card ‘PDOUT’
- Register Card ‘Parameter Set’

3.4.2.1 Module Configuration Table

The upper part of the screen displays the module configuration table:

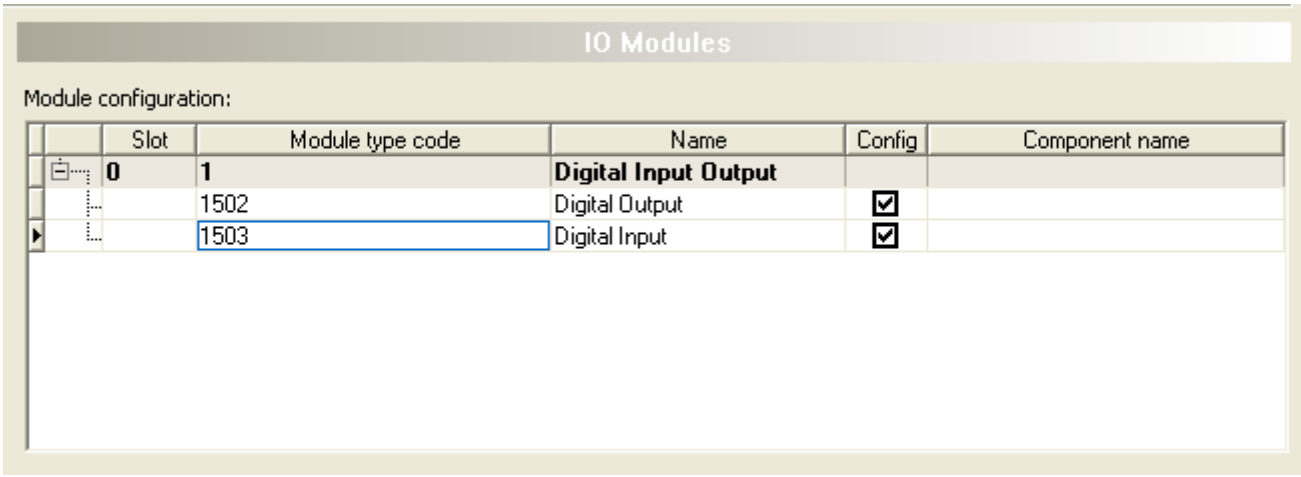


Figure 9: Configuration > Modules (Upper Part)

The meaning of the various columns is the following:

Slot

The slot number where the module is plugged (indicating the order of modules). The value 0 is reserved for the bus head. If a compact device is shown, there will be only slot 0 as it only consists of a bus head.

Module type code

A code uniquely assigned to a specific module type of the list in section Introduction. (Module type code relates only to the upper line.)

Name

The name of the function group associated with the selected line of the module configuration table.

Config

Boolean value indicating whether or not the function group is configured.

Component Name

The component name as defined in the Electronic Label.

The module configuration table is organized as follows:

- Each line, which is printed in **strong** and is not empty in the *Slot* column, represents a (compact or modular) IO device in the sense of SERCOS III FSP IO.
- Each other line (no entry in slot column, normally printed) represents a single function group (such as *Digital Output* and *Digital Input* in the example) within the IO device mentioned in the next strong printed line above.

The following function groups are defined within the SERCOS III FSP IO specification (see reference 7):

IDN	Name of Function Group
S-0-1501	Unknown
S-0-1502	Digital Output
S-0-1503	Digital Input
S-0-1504	Analog Output
S-0-1505	Analog Input
S-0-1506	Counter
S-0-1507	Complex Protocol
S-0-1508	Sub bus Master
S-0-1509	Sub bus Slave
S-0-1510	Safety Output
S-0-1511	Safety Input
S-0-1512	Module-PLC
S-0-1513	Motor starter
S-0-1514	PWM
S-0-1515	Positioning
S-0-1516	Passive

Table 12: Available Function Groups for IO Modules

3.4.2.2 Register Card ‘General’

This register card displays general information on the selected function group.

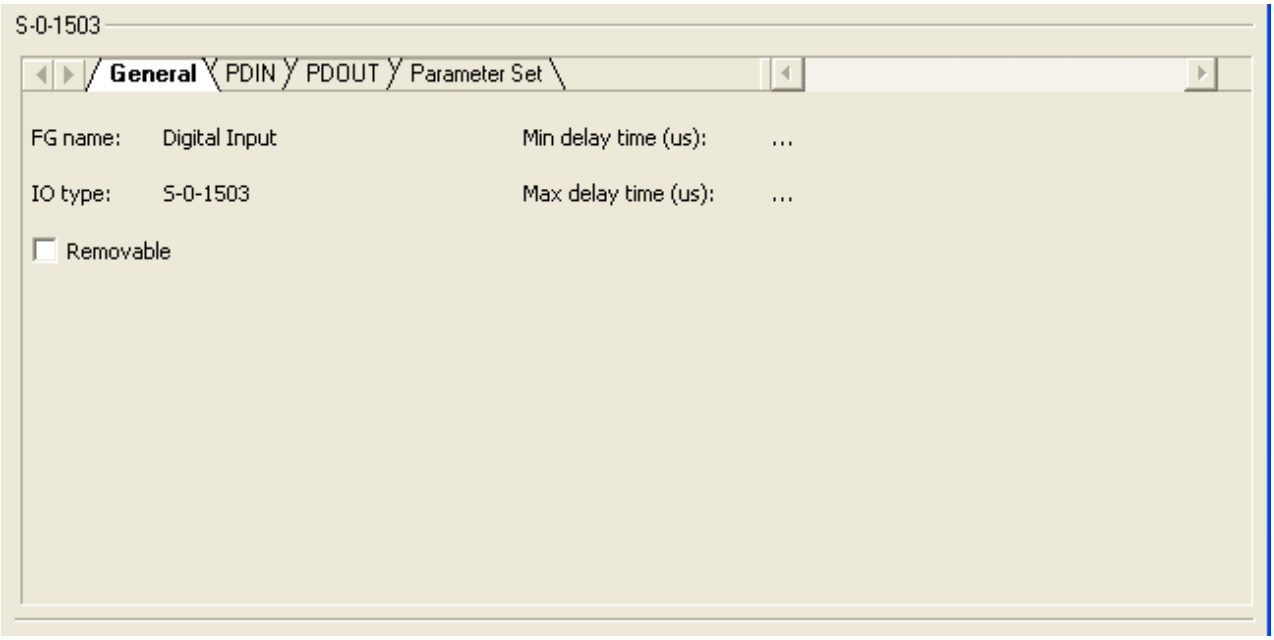


Figure 10: Configuration > Modules (Lower Part), Register Card 'General'

In detail, the following information is displayed:

Module Type Code

A code uniquely assigned to a specific module type of the list in section Introduction.

FG Name

The name of the function group associated with the selected line of the Module Configuration Table.

IO Type

Here the IDN corresponding to the selected function group is listed. This is an IDN in the range between S-0-1501 and S-0-1516, see list in section *Introduction*.

Min delay time (µs)

This value represents the minimum configurable delay time. The value is optional, so it may be missing as in the example above.

Max delay time (µs)

This value represents the maximum configurable delay time. The value is optional, so it may be missing as in the example above.

Removable

The Boolean value indicates whether the module to which the function group belongs is removable, or not.

3.4.2.3 Register Card ‘PDIN’

This register card displays information on the PDIN data area of the selected function group.

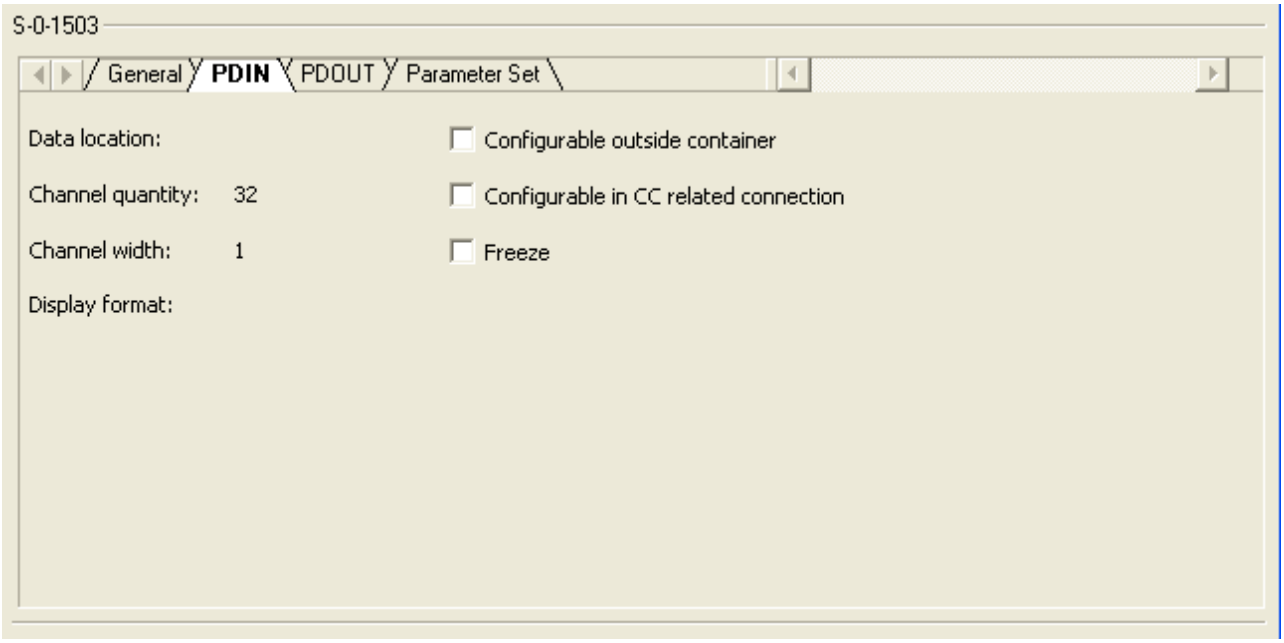


Figure 11: Configuration > Modules (Lower Part), Register Card ‘PDIN’

In detail, the following information is displayed:

Module Type Code

A code uniquely assigned to a specific module type of the list in section Introduction.

Channel quantity

This item is configured within the SDDML file of the device. It contains the number of channels of the Process Data Input PDIN.

Channel width

This item is configured within the SDDML file of the device. It contains the number of bits within one channel of the Process Data Input PDIN.

Configurable outside container

This Boolean value is configured within the SDDML file of the device. It indicates whether the device is also configurable outside of the container or not.

Configurable in CC related connection

This Boolean value is configured within the SDDML file of the device. It indicates whether the device is also configurable in a connection related to cross communication.

Freeze

The Boolean value indicates the fall-back behavior of the device concerning the input data, i.e. whether the data will be frozen, or set to 0.

If the selected item has no inputs, the register card ‘PDIN’ is grayed out.

3.4.2.4 Register Card ‘PDOUT’

This register card displays information on the PDOUT data area of the selected function group.

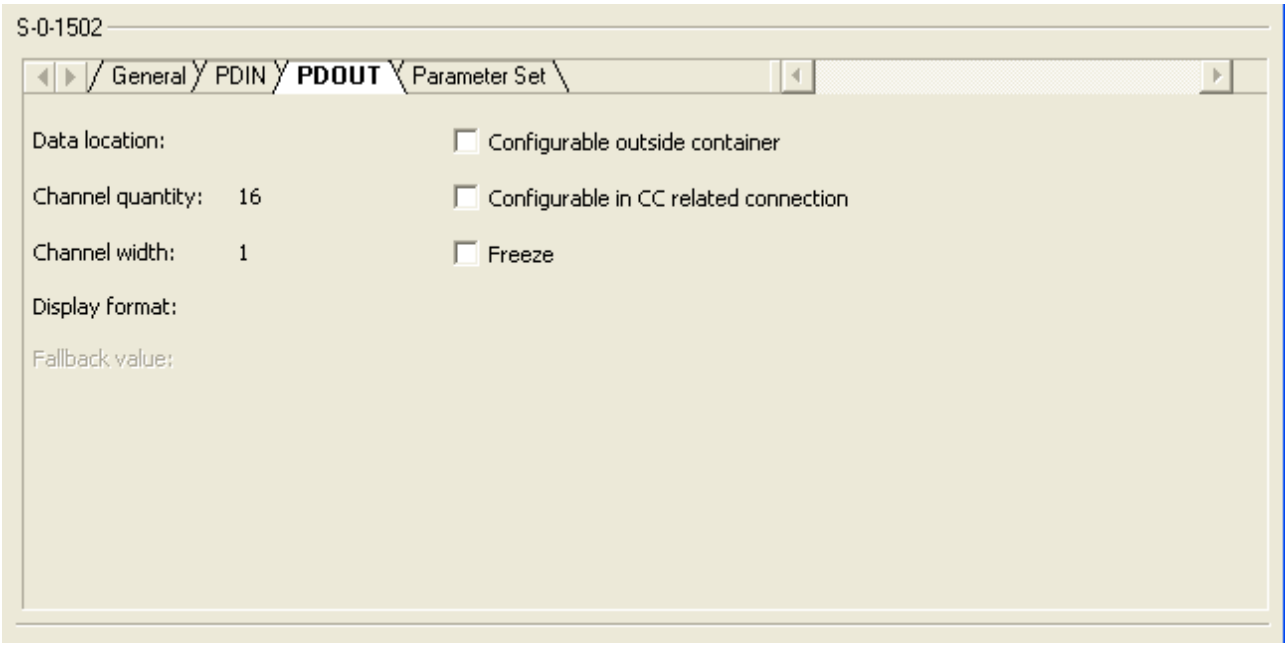


Figure 12: Configuration > Modules (Lower Part), Register Card ‘PDOUT’

In detail, the following information is displayed:

Module Type Code

A code uniquely assigned to a specific module type of the list in section Introduction.

Channel quantity

This item is configured within the SDDML file of the device. It contains the number of channels of the Process Data Output PDOUT.

Channel width

This item is configured within the SDDML file of the device. It contains the number of bits within one channel of the Process Data Output PDOUT.

Configurable outside container

This Boolean value is configured within the SDDML file of the device. It indicates whether the device is also configurable outside of the container or not.

Configurable in CC related connection

This Boolean value is configured within the SDDML file of the device. It indicates whether the device is also configurable in a connection related to cross communication.

Freeze

The Boolean value indicates the fall-back behavior of the device concerning the output data, i.e. whether the data will be frozen, or set to 0.

If the selected item has no outputs, the register card ‘PDOUT’ is grayed out.

3.4.2.5 Register Card ‘Parameter Set’

This register card displays information on the parameter set of selected function group.

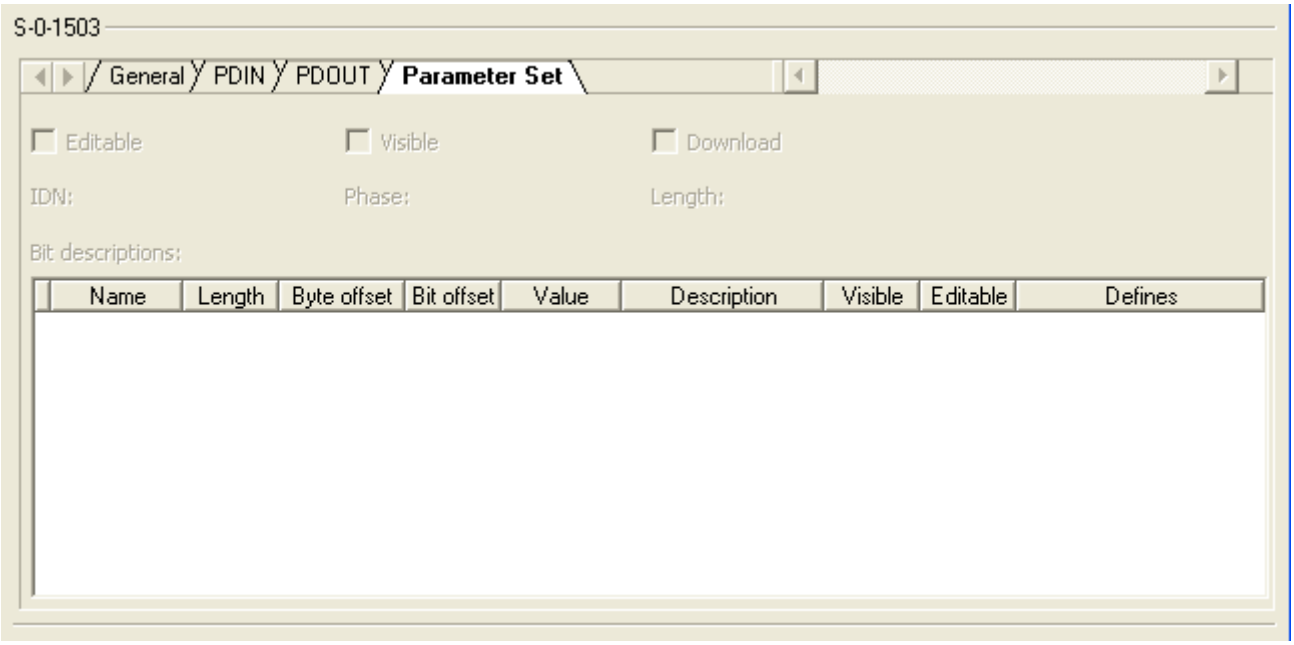


Figure 13: Configuration > Modules (Lower Part), Register Card ‘Parameter Set’

The following information is accessible on the upper part of this register card:

Frame

Module Type Code

A code uniquely assigned to a specific module type of the list in section Introduction.

Text fields in upper part

IDN

This text field contains the number of the IDN.

Phase

This text field contains the affected communication phase.

Length

This text field contains the total length.

Checkboxes

Editable

This checkbox decides whether only editable parameters of function groups or all parameters are displayed.

Visible

This checkbox decides whether only visible parameters of function groups or all parameters are displayed.

Download

The following information is accessible on the lower part of this register card:

Table in lower part

The meaning of the various columns of the table in the lower part is the following:

Name

This column contains the name of the parameter associated with the selected line of the parameter set table.

Length

This column contains the length (specified in units of bits) of the parameter associated with the selected line of the parameter set table.

Byte offset

This value contains the position, i.e. the offset in bytes within the data container (for input or output data, respectively) of the data selected with this line.

Bit offset

This value is always 1 if the data are byte aligned. Otherwise it contains the bit offset within the respective byte.

Value

The numeric value of the data of the selected function group.

Description

This column contains a description of the meaning of the selected function group.

Visible

This Boolean value indicates whether the selected function group is visible or not.

Editable

This Boolean value indicates whether the selected function group is editable or not.

Defines

3.4.3 User-defined Parameters (for FSP IO)

This dialog pane displays information on the parameter set associated with the selected function group.

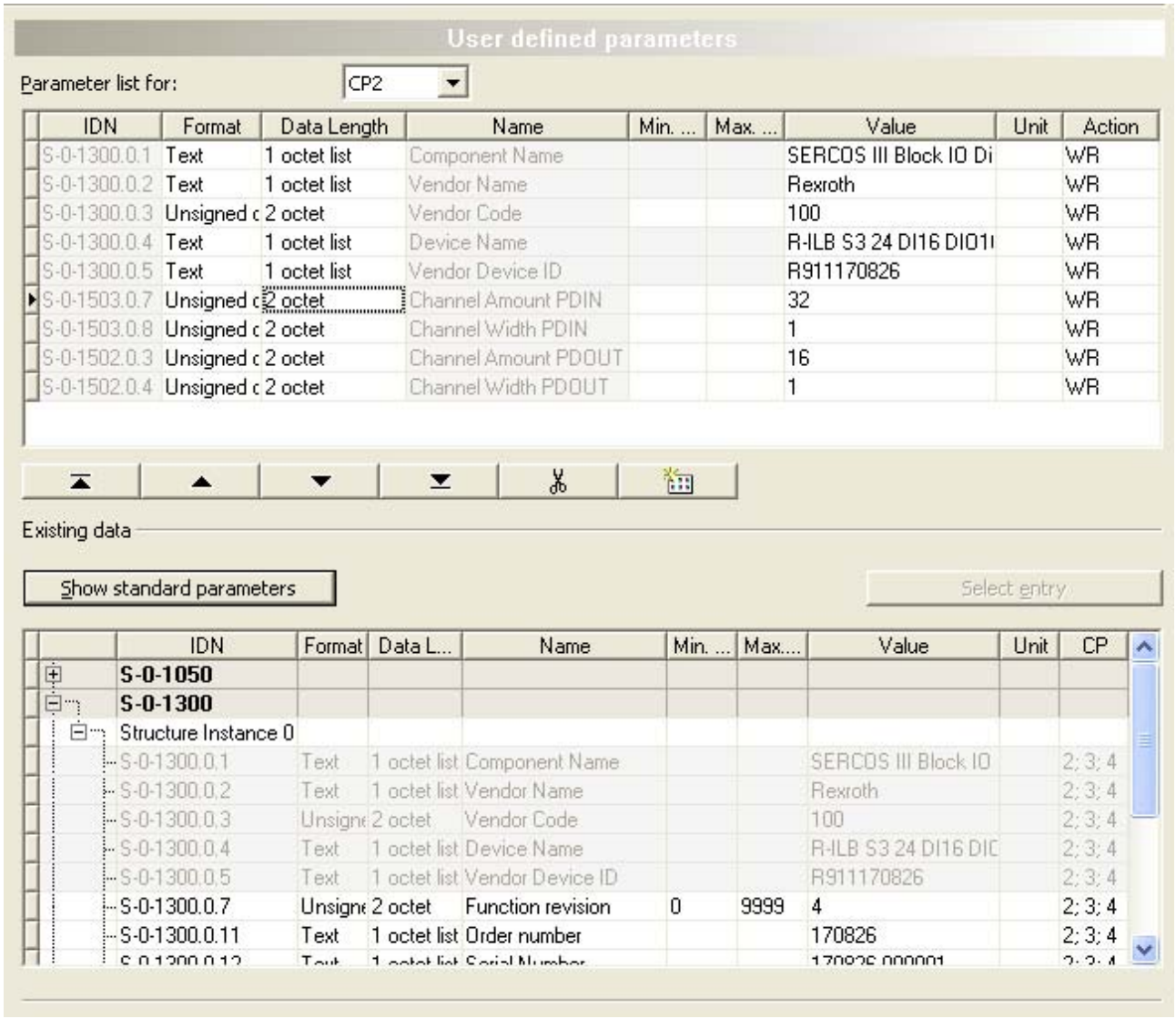


Figure 14: User-defined Parameters Pane

The dialog pane mainly consists of two tables:

The upper table contains a list of parameters that are set during CP2, CP3 or CP4.

The contents of the upper table depends on the choice of the combo box just above the table (which offers CP2, CP3 and CP4 as alternatives).

3.4.3.1 Columns of upper Table

The columns within the upper table have the following meaning:

IDN

This column identifies the IDN (including Structure Index and Structure Element) to be processed in CP2, CP3 or CP4.

Format

This column contains the information about the data type of the data associated with the IDN. The possible data types available for your choice are:

- Binary
- Unsigned decimal
- Signed decimal
- Hex
- Text
- IDN
- Float

Data Length

This column contains the length of the data associated with the IDN.

Possible values are:

- 2 Octets
- 4 Octets
- 8 Octets
- 1 Octet List
- 2 Octet List
- 4 Octet List
- 8 Octet List

Note: An octet corresponds to a byte in this context.

Not all combinations may be applied. The following table shows which combinations may be chosen:

Data type	2 Octets	4 Octets	8 Octets	1 Octet List	2 Octet List	4 Octet List	8 Octet List
Binary	X	X	X		X	X	x
Unsigned decimal	X	X	X	X	X	X	X
Signed decimal	X	X	X		X	X	X
Hex	X	X	X	X	X	X	X
Text				x			
IDN	X	X			X	X	
Float		X	X			X	X

Table 13: Allowed Data Length Value in Dependence of Format/Data Type

An incorrect choice of the data length which does not match with the selected value of *Format* will be marked with a red exclamation mark in the cell where the incorrect choice was made. This looks like:

Name

This column contains a descriptive text for the function associated with the IDN, for instance ‘Producer Cycle Time’ or ‘Vendor Name’.

Min.Value

If the range of allowed values for this IDN is restricted, this column contains the minimum allowed value. This column is optional.

Max.Value

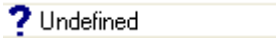
If the range of allowed values for this IDN is restricted, this column contains the maximum allowed value. This column is optional.

Value

This column contains

- The value to be written into the IDN (in case of `Action code = WR`, see below)
- The value to be compared with the contents of the IDN (in case of `Action code = RDCMP`, see below)
- In case of `Action code = EXEC`, there is no need to fill in a value here.

If the value put in here is not compatible with the values specified at *Format* and *Data Length,* this will be indicated by



You should then fill in a correct value.

Unit

This column allows to specify a unit associated with the value. This column is optional.

Action

Here the action to be performed with the IDN has to be specified. The choice between three alternatives is offered here:

Action code	Performed action
WR	Write
RDCMP	Read and compare
EXEC	Execution of Procedure Command

Table 14: Possible Actions to be performed with chosen IDN

EXEC requires the IDN to contain a Procedure Command. On the other hand, WR and RDCMP require the IDN not to contain a Procedure Command.

For an explanation of the navigation buttons see section “*Table Line Buttons*” of this document.

3.4.3.2 Columns of the lower Table

The lower table is used as tool for easily filling the upper table with standard data. It is not editable.

It contains representations of lists of proposed IDNs and their Structure Instances and Structure Elements:

At first, the lower table contains nothing.

Clicking the button "*Show standard parameters*" right above the lower table will fill the table with a list of the applicable functions (structured by their IDNs, Structure Instance and Structure Element).

At the top of each such list, there is one line representing the entire IDN. In the first column there is a symbol allowing to expand or collapse the list of that IDN. Besides this column, there is only one column filled, namely the IDN column containing the complete denomination of the IDN.

The following IDNs may appear here:

S-0-1050	SERCOS III Connections
S-0-1300	Electronic Label
S-0-1501	unknown
S-0-1502	Digital Output
S-0-1503	Digital Input
S-0-1504	Analog Output
S-0-1505	Analog Input
S-0-1506	Counter
S-0-1507	Complex Protocol
S-0-1508	Sub bus Master
S-0-1509	Sub bus Slave
S-0-1510	Safety Output
S-0-1511	Safety Input
S-0-1512	PLC-Module
S-0-1513	Motor starter
S-0-1514	PWM (Pulse Width Modulation)
S-0-1515	Positioning
S-0-1516	Passive

Table 15: Relevant IDNs that may appear in lower Table

Under each IDN list entry, you can find one or more *Structure Instance* entries. These also have a node symbol in the structure tree in the first column which again can be expanded or collapsed. (These node symbols are shifted a bit to the right compared to the node symbols of the IDN list entries.) Besides this column, there is only one column filled, namely the IDN column containing the text *Structure Instance* and the number of the Structure Instance.

Under each *Structure Instance* entry, you can find one or more *Structure Element* entries. Only these contain the relevant information to be selected and only for these the columns *Format, Data Length, Name, Min.Value, Max.Value, Value, Unit, CP* may be filled with data.

In order to transfer the data of a single *Structure Element* entry of the lower table to the upper table for the currently chosen communication phase:

- either click the button "*Select entry* " , when the desired line of the lower table is marked,
- or double click at the desired line of the lower table.

Note: It is not possible to select more than one line in the lower table.

The columns within the lower table have the following meaning:

IDN

This column identifies the IDN (including Structure Instance and Structure Element) of the function proposed in the current line.

Format

This column contains the information about the data type of the data associated with the IDN. The possible data types allowed here are:

- Binary
- Unsigned decimal
- Signed decimal
- Hex
- Text
- IDN
- Float

Data Length

This column contains the length of the data associated with the IDN.

The possible data types that may appear here:

- 2 Octets
- 4 Octets
- 8 Octets
- 1 Octet List
- 2 Octet List
- 4 Octet List
- 8 Octet List

Name

This column contains a descriptive text for the function associated with the IDN.

Min.Value

If the range of allowed values for this IDN is restricted, this column contains the minimum allowed value.

Max.Value

If the range of allowed values for this IDN is restricted, this column contains the maximum allowed value.

Value

This column contains the stored standard value of the respective IDN originating from the SDDML file.

Unit

This column contains a unit associated with the value, if one has been specified.

CP

This column contains the numbers of the communication phases, when the respective IDN is applicable. Allowed values are 2, 3 and 4 denoting the communication phases CP2, CP3 and CP4.

3.4.4 Process Data

This register card displays information on the process data of the selected function group.

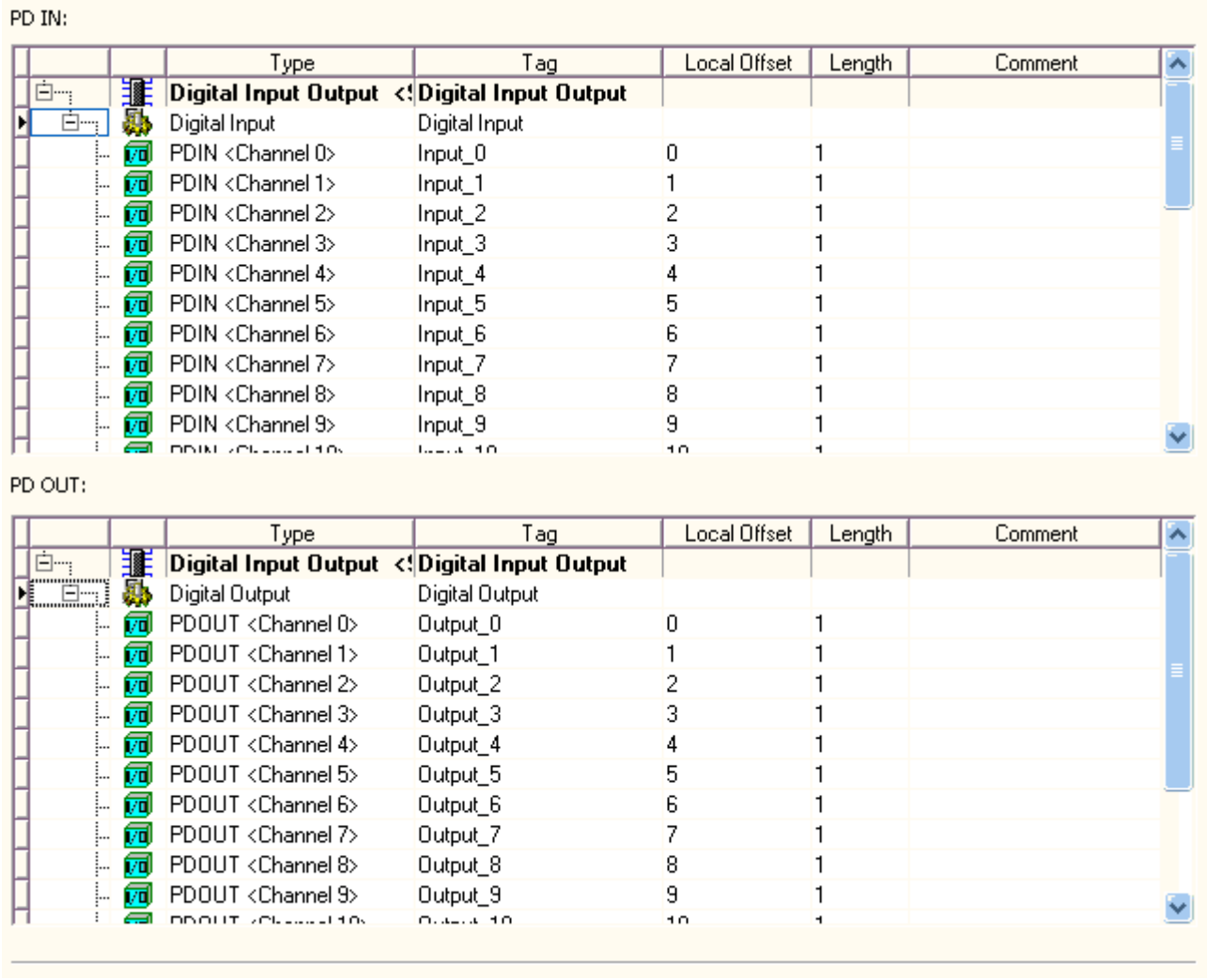


Figure 15: Process Data Pane

This pane consists mainly of two tables:

- The upper table contains a list of channels defined of PDIN.
- The lower table contains a list of channels defined of PDOUT.

Both tables have the same structure.

The columns have the following meaning:

Type

This column shows the type of the channel. It is not editable.

Tag

This column shows a tag (short name) of the channel. This column is the only editable one in this table.

Local offset

This column shows the local offset of the channel as a numeric value. It is not editable.

Length

This column shows the length of the channel as a numeric value in units of bits. It is not editable.

Comment

This column may contain a comment.

3.5 FSP Drive

3.5.1 Drive Connections

3.5.1.1 Producer Connections

In order to configure producer connections for drives, the pane **Producer** can be used:

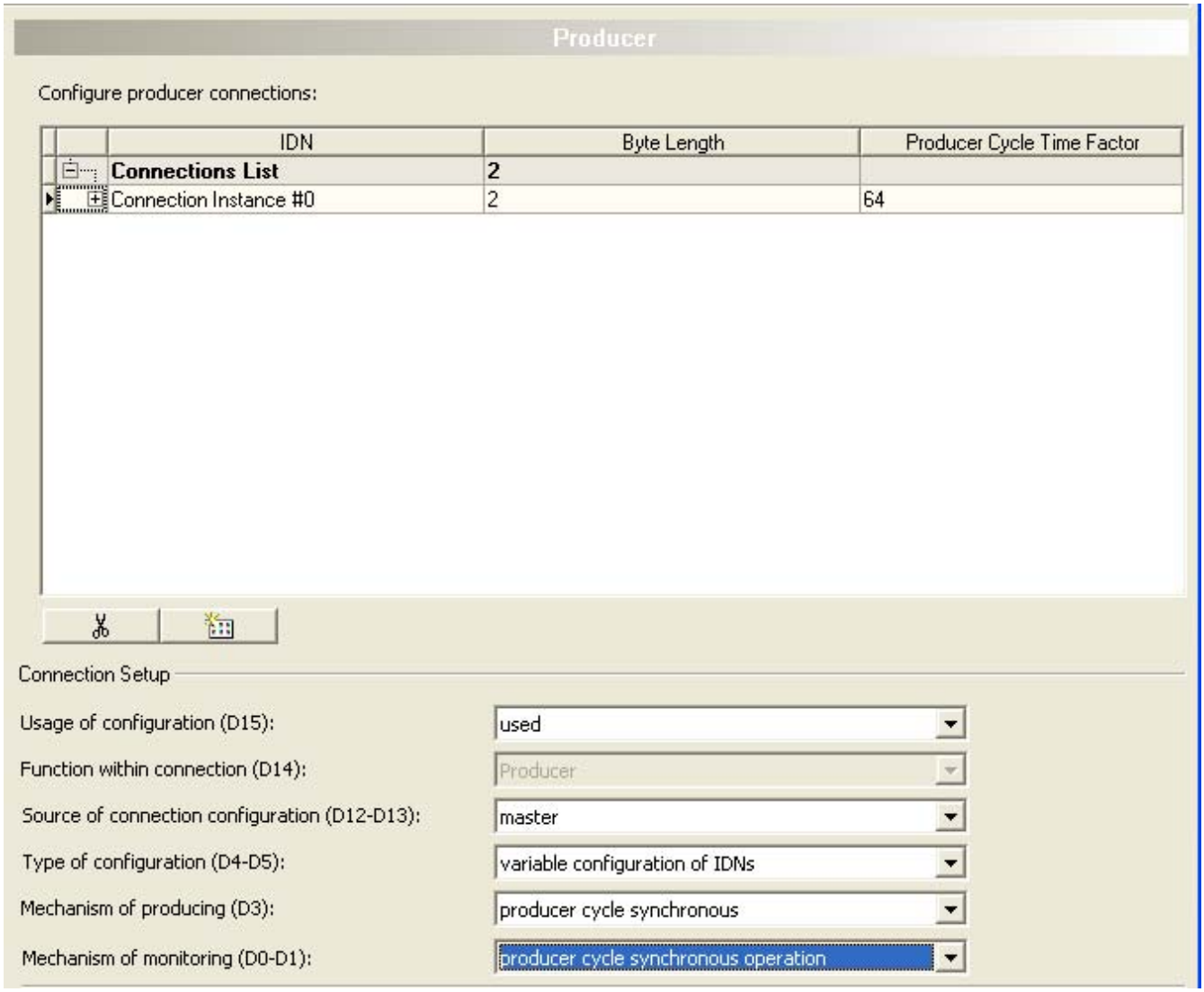


Figure 16: Drive Connections > Producer

The upper part of the dialog pane displays a table containing all configured producer connections. Each entry in the table corresponds to a configured producer connection which can be selected.

The columns of this table have the following meaning:

IDN

The IDN of the producer connection

Byte length

The length of the producer connection specified in bytes

Producer Cycle Time Factor

The cycle time factor of the producer connection. It corresponds to S-0-1050.x.10.

The navigation buttons within the upper part of the dialog pane allow creation and deletion of producer connection entries. For a detailed explanation of the navigation buttons also see section "*Table Line Buttons*" of this document.

Within the lower part of the dialog pane (this is below the title 'Connection Setup') you can adjust and configure the following settings related to the selected producer connection via a combo box each:

- Usage of configuration (D15)

Possible choices for this combo box are *Used* and *Not used.*

- Function within connection (D14)

This combo box is fixed to the value *Producer*.

- Source of connection configuration (D12-D13)

The only possible choices for this combo box is currently *Master*.

- Type of configuration (D4-D5)

Possible choices for this combo box are

  - *variable configuration of IDNs*
  - *configuration with connection length*
  - *standard telegram*

- Mechanism of producing (D3)

Possible choices for this combo box are:

  - *producer cycle synchronous*
  - *asynchronous*

- Mechanism of monitoring (D0-D1)

Possible choices for this combo box are

  - *producer cycle synchronous operation*
  - *asynchronous operation with watchdog*
  - *asynchronous operation without watchdog*

3.5.1.2 Consumer Connections

In order to configure consumer connections for drives, the pane **Consumer** can be used:

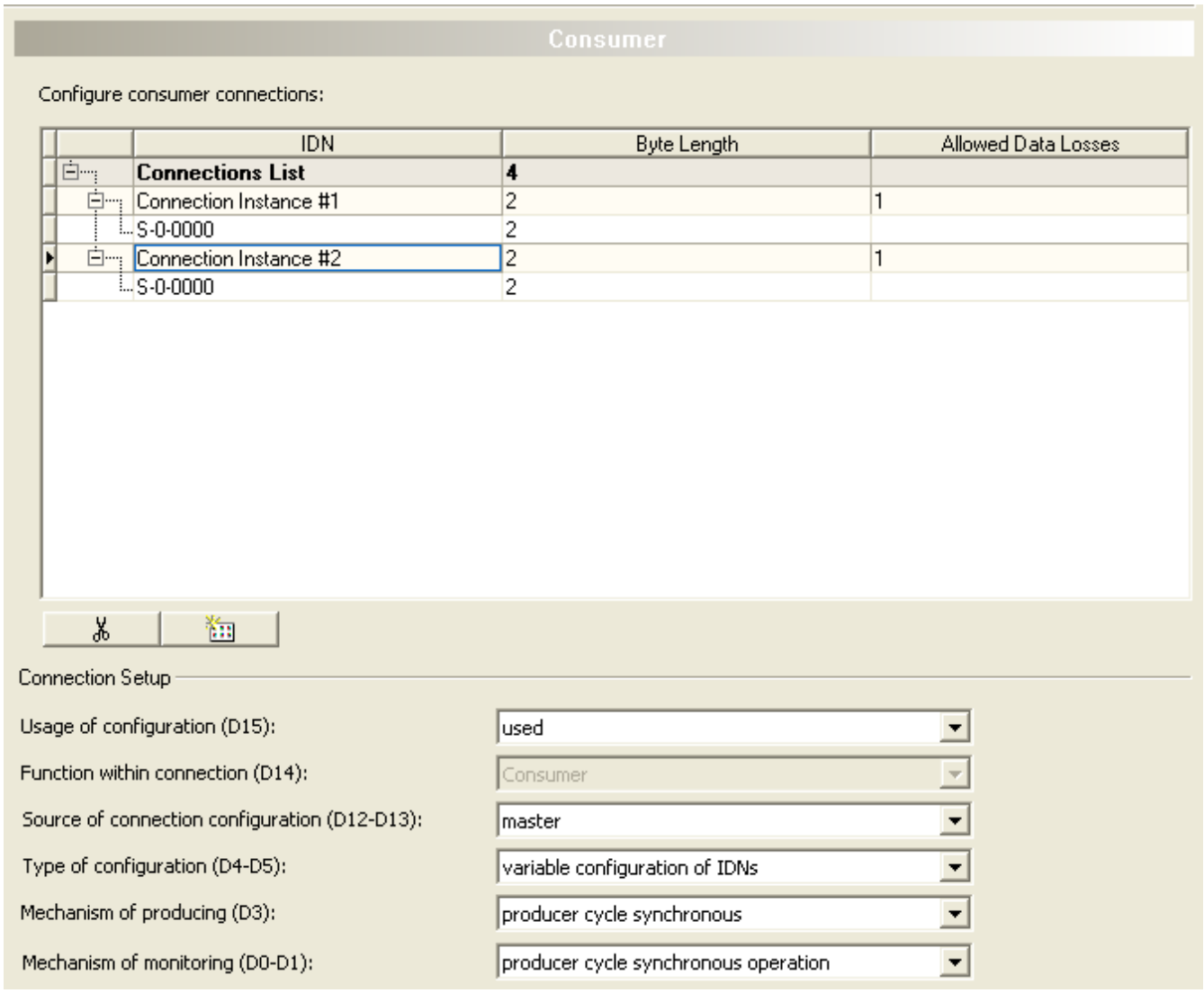


Figure 17: Drive Connections > Consumer

The upper part of the dialog pane displays a table containing all configured consumer connections. Each entry in the table corresponds to a configured consumer connection which can be selected. The columns of this table have the following meaning:

The columns have the following meaning:

IDN

The IDN of the consumer connection

Byte length

The length of the consumer connection specified in bytes. It corresponds to IDN S-0-1050.x.4.

Allowed Data Losses

The allowed number of data loss events for the chosen connection before it will be interrupted. It corresponds to S-0-1050.x.11.

The navigation buttons within the upper part of the dialog pane allow creation and deletion of consumer connection entries. For a detailed explanation of the navigation buttons also see section "*Table Line Buttons*" of this document.

Within the lower part of the dialog pane (this is below the title 'Connection Setup') you can adjust and configure the following settings related to the selected producer connection via a combo box each:

- Usage of configuration (D15)

Possible choices for this combo box are *Used* and *Not used.*

- Function within connection (D14)

This combo box is fixed to the value *Consumer*.

- Source of connection configuration (D12-D13)

The only possible choices for this combo box is currently *Master*.

- Type of configuration (D4-D5)

Possible choices for this combo box are

  - *variable configuration of IDNs*
  - *configuration with connection length*
  - *standard telegram*

- Mechanism of producing (D3)

Possible choices for this combo box are:

  - *producer cycle synchronous*
  - *asynchronous*

- Mechanism of monitoring (D0-D1)

Possible choices for this combo box are

  - *producer cycle synchronous operation*
  - *asynchronous operation with watchdog*
  - *asynchronous operation without watchdog*

3.5.2 User-defined Parameters (for FSP Drive)

This register card displays information on the parameter set associated with the selected function group.

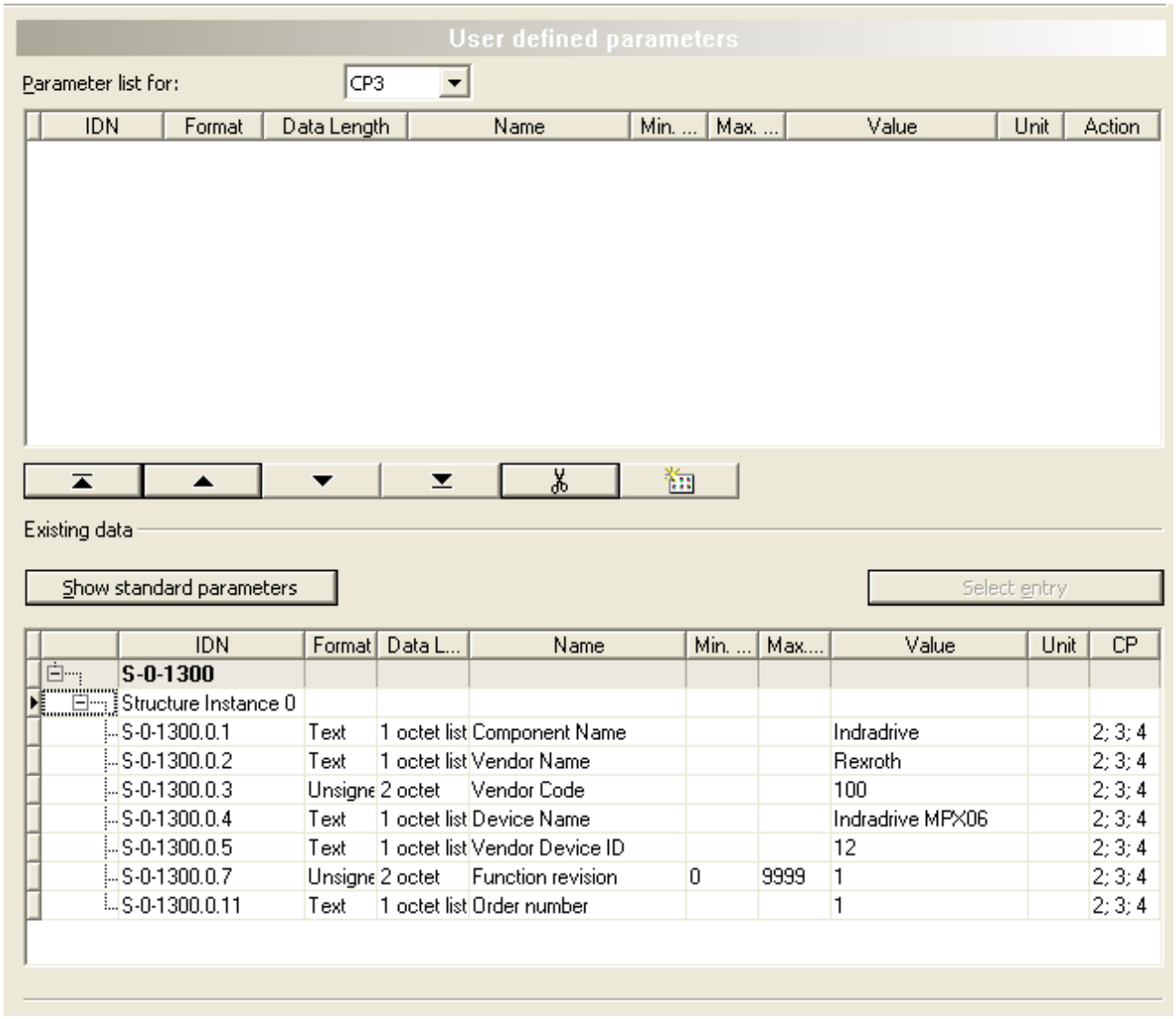


Figure 18: User-defined Parameters Dialog Pane

This dialog pane consists mainly of two tables:

The upper table contains a list of parameters that are set during CP2, CP3 or CP4.

The contents of the upper table depends on the choice of the combo box just above the table (which offers CP2, CP3 and CP4 as alternatives).

The lower table is described in section *Columns of the lower Table* on page 48 of this document.

3.5.2.1 Columns of the upper Table

The columns within the upper table have the following meaning:

IDN

This column identifies the IDN (with Structure Index and Structure Element) to be processed in CP2, CP3 or CP4.

Format

This column contains the information about the data type of the data associated with the IDN. The available data types for your choice are:

- Binary
- Unsigned decimal
- Signed decimal
- Hex
- Text
- IDN
- Float

Data Length

This column contains the length of the data associated with the IDN.

Possible values are:

- 2 Octets
- 4 Octets
- 8 Octets
- 1 Octet List
- 2 Octet List
- 4 Octet List
- 8 Octet List

Note: An octet corresponds to a byte in this context.

Not all combinations may be applied. The following table shows which combinations may be chosen:

Data type	2 Octets	4 Octets	8 Octets	1 Octet List	2 Octet List	4 Octet List	8 Octet List
Binary	X	X	X		X	X	x
Unsigned decimal	X	X	X	X	X	X	X
Signed decimal	X	X	X		X	X	X
Hex	X	X	X	X	X	X	X
Text				x			
IDN	X	X			X	X	
• Float		X	X			X	X

Table 16: Allowed Data Length Value in Dependence of Format/Data Type

An incorrect choice of the data length which does not match with the selected value of *Format* will be marked with a red exclamation mark in the cell where the incorrect choice was made. This looks like:

Name

This column contains a descriptive text for the function associated with the IDN, for instance ‘Producer Cycle Time’ or ‘Vendor Name’.

Min.Value

If the range of allowed values for this IDN is restricted, this column contains the minimum allowed value. This column is optional.

Max.Value

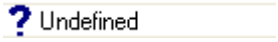
If the range of allowed values for this IDN is restricted, this column contains the maximum allowed value. This column is optional.

Value

This column contains

- The value to be written into the IDN (in case of `Action code = WR`, see below)
- The value to be compared with the contents of the IDN (in case of `Action code = RDCMP`, see below)
- In case of `Action code = EXEC`, there is no need to fill in a value here.

If the value put in here does is not compatible with the values specified at *Format* and *Data Length,* this will be indicated by



You should then fill in a correct value.

Unit

This column allows to specify a unit associated with the value. This column is optional.

Action

Here the action to be performed with the IDN has to be specified. The choice between three alternatives is offered here:

Action code	Performed action
WR	Write
RDCMP	Read and compare
EXEC	Execution of Procedure Command

Table 17: Possible Actions to be performed with chosen IDN

EXEC requires the IDN to contain a Procedure Command. WR and RDCMP require the IDN not to contain a Procedure Command

For an explanation of the navigation buttons see section “*Table Line Buttons*” of this document.

3.5.2.2 Columns of the lower Table

The lower table is used as tool for easily filling the upper table with standard data. It is not editable.

It contains representations of lists of proposed IDNs and their Structure Instances and Structure Elements:

At first, the lower table contains nothing.

Clicking the button "*Show standard parameters*" right above the lower table will fill the table with a list of the applicable functions (structured by their IDNs, Structure Instance and Structure Element).

At the top of each such list, there is one line representing the entire IDN. In the first column there is a symbol allowing to expand or collapse the list of that IDN. Besides this column, there is only one column filled, namely the IDN column containing the complete denomination of the IDN.

The following IDNs may appear here:

S-0-1300	Electronic Label

Table 18: Relevant IDNs that may appear in lower Table

Under each IDN list entry, you can find one or more *Structure Instance* entries. These also have a node symbol in the structure tree in the first column which again can be expanded or collapsed. (These node symbols are shifted a bit to the right compared to the node symbols of the IDN list entries.) Besides this column, there is only one column filled, namely the IDN column containing the text *Structure Instance* and the number of the Structure Instance.

Under each *Structure Instance* entry, you can find one or more *Structure Element* entries. Only these contain the relevant information to be selected and only for these the columns *Format, Data Length, Name, Min.Value, Max.Value, Value, Unit, CP* may be filled with data.

In order to transfer the data of a single *Structure Element* entry of the lower table to the upper table for the currently chosen communication phase:

- either click the button "*Select entry* " , when the desired line of the lower table is marked,
- or double click at the desired line of the lower table.

Note: It is not possible to select more than one line in the lower table.

The columns within the lower table have the following meaning:

IDN

This column identifies the IDN (including Structure Index and Structure Element) of the function proposed in the current line. For drives, only structure instances and structure elements of IDN **S-0-1300** are available.

Format

This column contains the information about the data type of the data associated with the IDN. The possible data types allowed here are:

- Binary
- Unsigned decimal
- Signed decimal
- Hex
- Text
- IDN
- Float

Data Length

This column contains the length of the data associated with the IDN.

The possible data types that may appear here:

- 2 Octets
- 4 Octets
- 8 Octets
- 1 Octet List
- 2 Octet List
- 4 Octet List
- 8 Octet List

Note: An octet represents a byte in this context.

Name

This column contains a descriptive text for the function associated with the IDN.

Min.Value

If the range of allowed values for this IDN is restricted, this column contains the minimum allowed value.

Max.Value

If the range of allowed values for this IDN is restricted, this column contains the maximum allowed value.

Value

This column contains the stored standard value of the respective IDN originating from the SDDML file.

Unit

This column contains a unit associated with the value, if one has been specified.

CP

This column contains the numbers of the communication phases, when the respective IDN is applicable. Allowed values are 2, 3 and 4 denoting the communication phases CP2, CP3 and CP4.

4 Description

4.1 About Description

Dialog Panes "Description"

The table below gives an overview for the **Description** dialog panes descriptions:

Section	Subsection	Page
Device Description	*About Description*	*50*
	SDDML	*51*

Table 19: Descriptions of the Dialog Panes Device Description

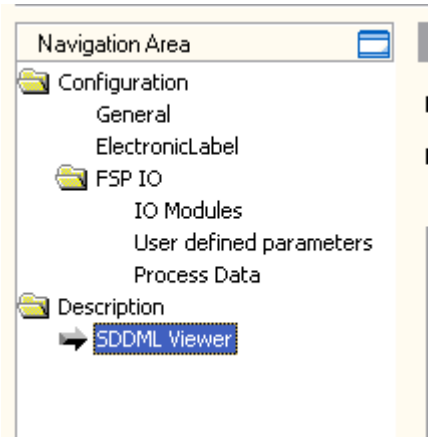


Figure 19: Navigation Area - Device Description

4.2 SDDML Viewer

The **SDDML Viewer** shows the content of the SDDML file in a text view.

Under **Filename** the absolute file directory path and the file name of the displayed SDDML file is displayed. **Find what** offers a search feature to search for text contents within the text of the SDDML file.

In the SDDML Viewer window on the left side, the line number is displayed for simple overview, the further entries show the SDDML file in text format.

Parameter	Meaning
File name	File directory path and the file name of the displayed SDDML file.
Find what	Search feature to search for text contents within the text of the SDDML file.
Match case	Search option
Match whole word	Search option

Table 20: Device Description – SDDML Viewer

Figure 20: SDDML Viewer

The **SDDML Viewer** page consists of the following elements:

- **File name** shows the absolute path of the DDF file.
- **Find what** offers searching for specific text within the DDF file.
- Using the **Find Next** button allows you to jump to the next occurrence of the text to be searched for within the XML DDF file.
- Check **Match case** if you want to perform a case-sensitive search.
- Check **Match whole word** if only entire words should match and fragments of words should be excluded from matching.

Note: You can also access the search functionality of the **SDDML Viewer** by typing **Ctrl-F** on the keyboard.

5 Diagnosis

5.1 Overview Diagnosis

Currently, there are no diagnosis capabilities available within the SERCOS III Generic Slave DTM.

6 Online Functions

6.1 Connecting/Disconnecting Device

Note: To access to the **diagnosis** panes and to use the diagnosis, requires an online connection from the generic SERCOS Slave DTM to the SERCOS Master DTM. This online connection can only be built up if a driver is assigned to the SERCOS Master device.

For information on how to select a driver, to scan for a device and to select it in the Master DTM dialog, refer to the user manual *DTM for SERCOS Master devices*.

Connecting Device

The following steps are needed to establish a connection from the generic SERCOS III Slave DTM to the SERCOS III Master DTM:

1. In the Master DTM dialog select a driver and configure it, scan for the device and select it and select and download the firmware.
2. Close the user dialog of the SERCOS Master DTM via the **OK** button.
3. Put a right-click on the device icon of the generic SERCOS Slave.
4. Select the **Connect** command from the context menu (right mouse button).

↬ The generic SERCOS III Slave DTM now is connected to the SERCOS III Master DTM via an online connection. In the network view the device description at the device icon is displayed with a green colored background.

Disconnecting Device

The following steps are needed to disconnect an online connection from the generic SERCOS Slave DTM to the SERCOS Master DTM:

1. Close the user dialog of the generic SERCOS Slave DTM via the **OK** button.
2. Right-click on the device icon of the generic SERCOS Slave.
3. Select the **Disconnect** command from the context menu (right mouse button).

↬ The online connection from the generic SERCOS Slave DTM to the SERCOS Master DTM is disconnected. In the network view the device description is displayed not any more with a green colored background.

6.2 Online Parameterization

You can access this dialog pane via right clicking on the slave device icon and selecting the menu entry **Configuration > Online Parameterization** if the device has already been connected correctly.

This dialog pane offers you the opportunity to manually read and write parameter data and to execute procedure commands associated with certain IDNs.

In detail, it looks like this:

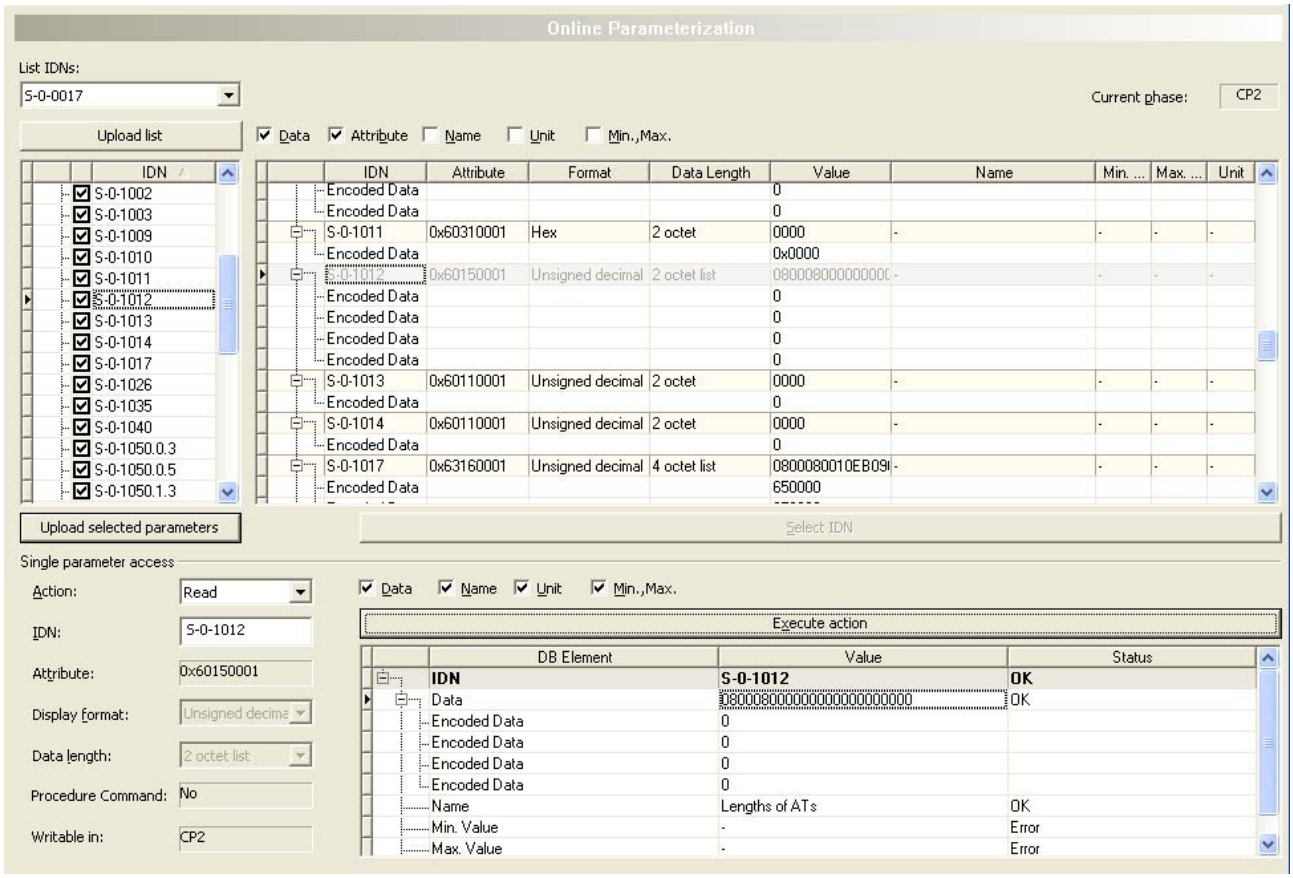


Figure 21: Configuration->Online Parameterization

6.2.1 Upper Part of Dialog Pane

In the upper left corner of the dialog pane, you can find a combo box titled *List IDNs*.

This combo box provides the following selection of IDN lists ordered by their List IDNs:

List IDN	Associated IDN List
S-0-0017	IDN-list of all operation data
S-0-0021	IDN-list of invalid operation data for CP2
S-0-0022	IDN-list of invalid operation data for CP3
S-0-0025	IDN-list of all procedure commands
S-0-0187	IDN-list of configurable data as producer
S-0-0188	IDN-list of configurable data as consumer
S-0-0192	IDN-list of all backup operation data
S-0-0219	IDN–list of parameter set
S-0-0270	IDN list of selected backup operation data
S-0-0279	IDN list of password protected data
S-0-0327	IDN list of checksum parameter
S-0-0398	IDN list of configurable real-time/status bits
S-0-0399	IDN list of configurable real-time/control bits
S-0-0423	IDN-list of invalid data for parameterization level
S-0-0428	IDN list of configurable measuring data
S-0-0444	IDN-list of configurable data in the AT data container
S-0-0445	IDN-list of configurable data in the MDT data container

Figure 22: Available IDN lists

The listed items are “List IDNs” i.e. IDNs really containing a list of other IDN numbers. These IDN numbers are listed in the list box below if you click on the *Upload List* button right below the *List IDNs* combo box.

In order to fill the table in the left upper part of the dialog pane with the listed IDNs associated to that List IDN, perform the following:

- Choose one of these List IDNs from the combo box mentioned above.
- Click on button *Upload list* to upload the list associated with the chosen List IDN.

- The table in the left upper part of the dialog pane with the listed IDNs is filled with the IDN numbers of all IDNs currently listed within the chosen List IDN.

In the next step, you may choose which IDNs should be displayed in detail in the large table in the upper right part of the dialog pane. This done by checking or unchecking the check boxes just left of the IDN numbers.

You may choose none, a single, multiple or all IDN numbers for display in the large table on the upper right part of the dialog pane.

To select all IDNs,

- check the check box at the List IDN itself (serving as the root item of the displayed tree view), and all subordinated IDNs will be checked as well immediately.

To exclude all IDNs from selection,

- uncheck the List IDN itself similarly.

To select or unselect a single IDN,

- only check or uncheck the check box located at that IDN.

In order to display those selected IDNs,

➢ Just click the button *Upload Selected Parameters*.

➮ The large table in the upper right part of the dialog pane will now be filled with all relevant information about the selected IDNs. It looks like:

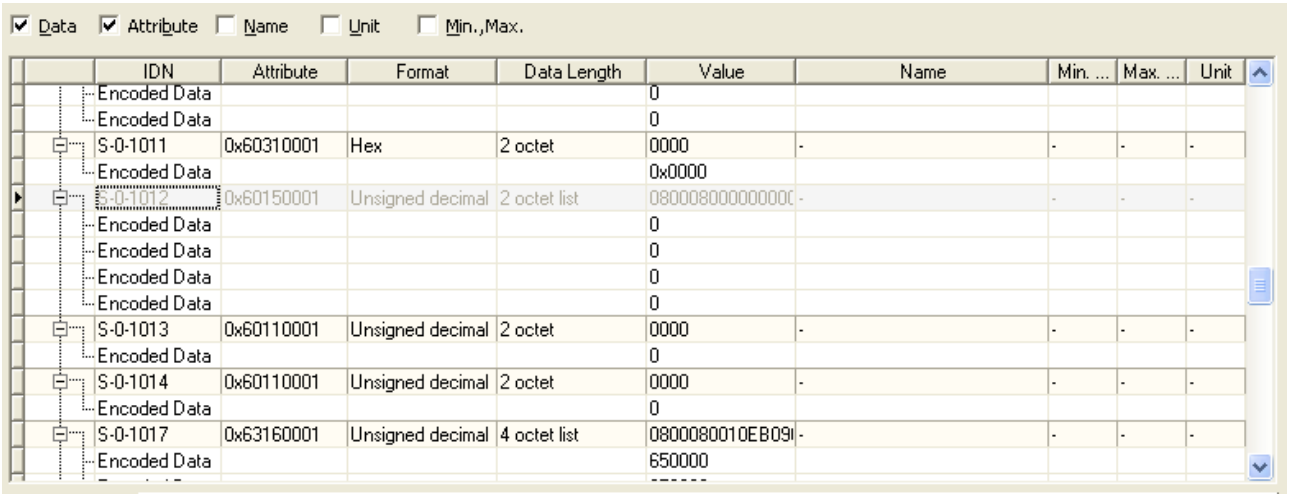


Figure 23: Upper right Part of the Dialog Pane

The columns provide the following information about each IDN:

IDN

The IDN whose information is displayed on the same line in the other columns.

Attribute

The numerical value of the attribute. This item is only displayed if the check box *Attribute* above the table has been checked.

Format

The format (i.e. the data representation) in which the data contained in the IDN are stored (such as hexadecimal or unsigned decimal storage).

Data Length

The reserved length for storage of that data.

Value

The stored value of the IDN itself. This item is only displayed if the check box *Data* above the table has been checked.

Name

The name of the IDN, if available. This item is only displayed if the check box *Name* above the table has been checked.

Min.

The minimum allowed value of the value of the IDN. This item is only displayed if the check box *Min.,Max.* above the table has been checked.

Max.

The maximum allowed value of the value of the IDN. This item is only displayed if the check box *Min.,Max.* above the table has been checked.

Unit

The unit associated with the value of the IDN, if any is associated at all. This item is only displayed if the check box *Unit.* above the table has been checked.

For each displayed IDN, the table contains one line containing the above mentioned information about the IDN itself, and, if necessary, one or more additional lines for possibly present data (depending on the chosen IDN). In these additional lines, only the columns *IDN* and *Value* are filled.

Some additional informations on these columns follow here:

6.2.1.1 Attribute

This column contains additional information required for administrative purposes. It is mandatory.

It is a 32-bit wide bit mask to be interpreted according to the subsequent table:

Note: UTF8 is supported.

Coding of Attribute Information in IDN

D31	D30	D29	D28	D27-D24	D23	D22-D20	D19	D18-D16	D15-D0
									Conversion factor used for conversion of data to display format, specified as unsigned integer. Use 1 if not required (for instance for binary, character string or floating point number data)
								Data length (required for correct termination of data transmission on the service channel)	
								000	Reserved
								001	Two bytes of operation data
								010	Four bytes of operation data
								011	Eight bytes of operation data
								100	Length is variable/1-byte data strings
								101	Length is variable/2-byte data strings
								110	Length is variable/4-byte data strings
								111	Length is variable/8-byte data strings
							Function		
							0	Operation data/parameter	
							1	Command	
						Coding for data type and display format			
							Data type	**Display format**	
						000	Binary value	Binary	
						001	Unsigned integer	Decimal	
						010	Signed integer	Decimal + sign	
						011	Unsigned integer	Hexadecimal	

						100	Extended character set	Text
						101	Unsigned integer	IDN
						110	ANSI 754-1985 floating point number (single precision)	Decimal value with exponent (fraction after decimal point is not taken into account)
						111	Reserved	Reserved
					Reserved			
				Position of decimal point for input and display (not applicable to floating point data)				
				0000	No places following the decimal point			
				…				
				1111	15 places following the decimal point			
			Write protection in CP2					
			0	Write protection not effective for operation data				
			1	Write protection effective for operation data				
		Write protection in CP3						
		0	Write protection not effective for operation data					
		1	Write protection effective for operation data					
	Write protection in CP4							
	0	Write protection not effective for operation data						
	1	Write protection effective for operation data						
Reserved								

Table 21: Coding of Attribute Information in IDN

The display format and the data length must match. Corresponding combinations are marked in the table below:

Data Length	Binary	Unsigned decimal	Signed decimal	Hex	Text	IDN	Float	Time
2 octet	Yes	Yes	Yes	Yes	No	No	No	No
4 octet	Yes	Yes	Yes	Yes	No	Yes	Yes	No
8 octet	Yes	Yes	Yes	Yes	No	No	Yes	Yes
1 octet	No	Yes	No	Yes	Yes	No	No	No
2 octet list	Yes	Yes	Yes	Yes	No	No	No	No
4 octet list	Yes	Yes	Yes	Yes	No	Yes	Yes	No
8 octet list	Yes	Yes	Yes	Yes	No	No	Yes	Yes

Table 22: Allowed Combinations of Display Format and Data Length

For more information on the extended character set see the SERCOS III specification, appendix E.

6.2.1.2 Value

This column contains the stored value of the IDN itself.

Note: This item is only displayed if the check box Data above the table has been checked.

There are 3 formats defined in the SERCOS III standard which can be applied here:

- Fixed length format with 2 bytes
- Fixed length format with 4 bytes

Variable length format with support for up theoretically up to 65532 bytes (limited to 1368 bytes in the current implementation of the SERCOS III firmware.)

In case of the variable length format these bytes are structured as follows:

- The first two bytes contain the hexadecimally coded value of the current length of the data. This is the text the master proposes to the slave. If these two bytes are 0, no other data are required and a zero-length datum will be defined therefore.
- The next two bytes contain the hexadecimally coded value of the maximum allowed length of data if the slave is permitted to change the text. (If this length is equal to 0, the slave is not permitted to do so.)
- Beginning from the fifth byte there is a string consisting of up to 1368 bytes (characters) space for the data of the object assigned to the IDN. Characters exceeding the amount specified in the length bytes should be truncated by the SERCOS III slaves.

6.2.1.3 Name

This column holds the name of the operational data which are stored under the respective IDN. It is optional.

The length is limited to at most 64 bytes. At least 2 bytes need to be used.

These bytes are structured as follows:

- The first two bytes contain the hexadecimally coded value of the length of the programmed text. This is the text the master proposes to the slave. If these two bytes are 0, no other data are required and a zero-length name will be defined therefore.
- The next two bytes contain the hexadecimally coded value of the maximum allowed length of this text if the slave is permitted to change the text. (If this length is equal to 0, the slave is not permitted to do so.)
- Beginning from the fifth byte there is a string consisting of up to 60 bytes (characters) space for the actual name of the object assigned to the IDN. Characters exceeding the amount specified in the length bytes should be truncated by the SERCOS III slaves.

Also see *Figure 1: Name structure* of the SERCOS III Spec:

For more information, refer to the SERCOS III specification.

6.2.1.4 Min.

This column holds the minimum value allowed for the operational data which are stored under the respective IDN. It is optional.

Lower values cannot be processed by the slave, i.e. when a write request occurs with a lower value, the original value will not be changed..

The length is fixed to 64 bytes.

In the following cases this element is not applicable:

- Working with binary numbers
- Working with character strings
- Operation data have variable length

This item is only displayed if the check box *Min.,Max.* above the table has been checked.

6.2.1.5 Max.

This column holds the maximum value allowed for the operational data which are stored under the respective IDN. It is optional.

Higher values cannot be processed by the slave, i.e. when a write request occurs with a higher value, the original value will not be changed.

The length is fixed to 64 bytes.

In the following cases this element is not applicable:

- Working with binary numbers
- Working with character strings
- Operation data have variable length

This item is only displayed if the check box *Min.,Max.* above the table has been checked.

6.2.1.6 Unit

This column holds the name of unit to be applied to the operational data which are stored under the respective IDN. It is optional.

Note: This item is only displayed if the check box Unit. above the table has been checked.

For each displayed IDN, the table contains one line containing the above mentioned information about the IDN itself, and, if necessary, one or more additional lines for eventually present data (depending on the chosen IDN). In these additional lines, only the columns *IDN* and *Value* are filled.

The length is limited to at most 16 bytes. At least 2 bytes need to be used.

These bytes are structured as follows:

- The first two bytes contain the hexadecimally coded value of the length of the programmed text. This is the text the master proposes to the slave. If these two bytes are 0, no other data are required and a zero-length name will be defined therefore.
- The next two bytes contain the hexadecimally coded value of the maximum allowed length of this text if the slave is permitted to change the text. (If this length is equal to 0, the slave is not permitted to do so.)

- Beginning from the fifth byte there is a string consisting of up to 12 bytes (characters) space for the actual unit of the object assigned to the IDN. Characters exceeding the amount specified in the length bytes should be truncated by the SERCOS III slaves.

When the data type is either binary or character string, the data has no unit.

Also see *Figure 2: Unit structure* of the SERCOS III Specification.

Note: As the service channel transfers data in a word-aligned manner, it is recommended to use even values for the two length specifications described in this context.

For more information, refer to the SERCOS III specification.

6.2.2 Lower Part of Dialog Pane

You can highlight one single line of the large table in the upper right part of the dialog pane representing one specific IDN in order to be accessed within lower part of the dialog pane. (In the example given in *Figure 23: Upper right Part of the Dialog Pane* this specific IDN is IDN S-0-1012.)

Three kinds of actions can be performed with a single parameter of an IDN:

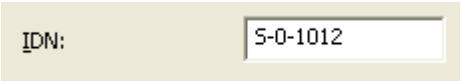
- Reading an IDN
- Writing an IDN
- Executing the procedure command associated to an IDN

In order to select a single parameter of a specific IDN for accessing, do the following:

➢ Highlight the line of your choice in the large table in the upper right part of the dialog pane.

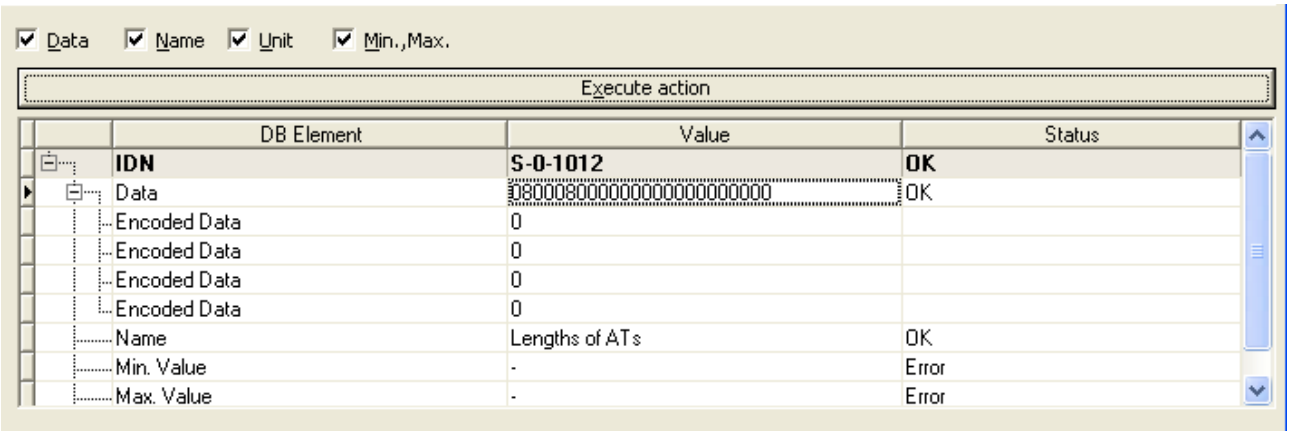
➢ Click on the button Select IDN in the center of the dialog pane.

↬ The IDN associated to the chosen line is selected for single parameter access. Which specific IDN has been chosen is now displayed on the left side at *IDN*.

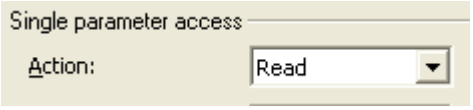


↬ Everything displayed within the lower part of the dialog pane i.e. below the line with the text “Single parameter access” now just relates to this chosen IDN.

↬ The table on the right side of the lower part of the dialog pane is now filled with current data. It allows you to enter the data to be changed.



The combo box Action on the left side of the lower part of the dialog pane allows you now to decide whether to read, write or execute the IDN



The *IDN* field shows the selected IDN according to the procedure described above:

This field is editable.

The *Attribute* field shows the attribute data of the selected IDN in hexadecimal representation. It is interpreted according to the procedure described in section *Attribute*.

This field is not editable.

The field *Display format* informs about the data format in which the data are stored and display depending on the data type. The following display formats are possible:

- Binary
- Unsigned decimal
- Signed decimal
- Hex
- Text
- IDN
- Float
- Time

This field is not editable.

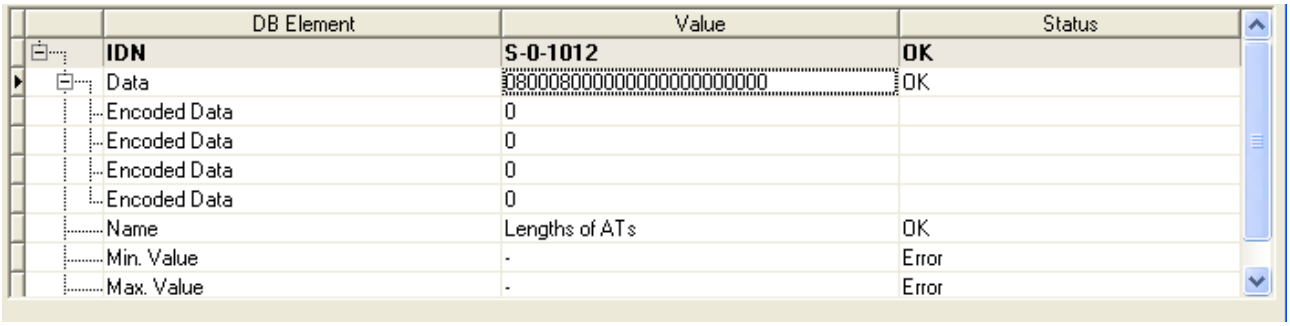
The field *Data length* informs about the data length of the data associated with the IDN. The following values are possible:

- 2 octet
- 4 octet
- 8 octet
- 1 octet
- 2 octet list
- 4 octet list
- 8 octet list

This field is not editable.

The field *Procedure command* shows whether the IDN contains a procedure command which can be executed by selecting *Execute* in the *Action* combo box, or not. This field is not editable.

The field *Writable in* displays the communication phase(s), when the IDN is writable.This field is not editable.



DB Element	Value	Status
IDN	**S-0-1012**	**OK**
Data	0800080000000000000000000	OK
Encoded Data	0	
Encoded Data	0	
Encoded Data	0	
Encoded Data	0	
Name	Lengths of ATs	OK
Min. Value	-	Error
Max. Value	-	Error

Figure 24: Table for reading and writing values of IDN Data and for Execution of Procedure Commands

The following is the meaning of the columns of table in the right lower part of the dialog pane:

The column *DB Element* lists the elements of the selected IDNs such as data, name, unit, minimum and maximum value.

The column *Value* contains the value of the DB Element. The value is editable.

The column *Status* shows whether changes were successful (*Ok*) or unsuccessful (*Error*).

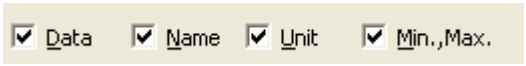
In order to make your changes of IDN data effective which you made in the *Value* column of the table:

➢ Click the *Execute action* button in order to make your changes effective.

➢ Depending on the chosen action in the *Action* combo box, data are read, written or the procedure command associated to the IDN is executed.

You can use the checkboxes above the table to display or inhibit displaying the items *Data, Name, Unit, Minimum Value* and *Maximum Value:*

These are



7 Appendix

7.1 User Rights

User-rights are set within the FDT-container. Depending on the level the configuration is accessible by the user or read-only.

To access the **Configuration**, **Device Description** and **Diagnosis** panes of the Generic SERCOS Slave DTM you do not need special user rights. Also all users can select the decimal or hexadecimal Display mode or sort table entries.

Note: To edit, set or configure the parameters of the **Configuration** panes, you need user rights for *Maintenance,* for *Planning Engineer* or for *Administrator*.

The following tables give an overview of the user right groups and which user rights you need to configure the single parameters.

7.1.1 Configuration

	Observer	Operator	Maintenance	Planning Engineer	Administrator
General	D	D	X	X	X
Electronic Label	D	D	X	X	X
FSP IO	D	D	X	X	X
FSP Drive	D	D	X	X	X

Table 23: Configuration (D = Displaying, X = Editing, Configuring)

7.2 References

[1] Device Type Manager (DTM) Style Guide, Version 1.0 ; FDT-JIG - Order No. <0001-0008-000>

[2] SERCOS III Slave Protocol API, Hilscher 2007-2009

[3] SERCOS III General Overview and Architecture, SERCOS International 2007

[4] SERCOS III Communication V1.1.1.5, SERCOS International 2007

[5] SERCOS III Parameter V1.1.2.1.2, SERCOS International 2009

[6] SERCOS III Generic Device Profile V1.1.0.6, SERCOS International 2007

[7] SERCOS III Function Specific Profile IO V1.1.1.1, SERCOS International 2007

[8] SERCOS III Function specific Profile Drives V1.1.2.11, SERCOS International 2007

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9 Glossary

Bus Head

The part of an IO Device which couples the device to the bus and does not belong to any function group. In the Module Configuration Table, the bus head is always located at slot 0.

CC

Cross communication between two slaves

Communication phase

During getting operational, a SERCOS III device runs through various phases. These are called communication phases.

For a detailed description see references [3] and [4].

Compact IO Device

A compact IO device is an IO Device which contains one or more fixed IO functions, for instance a 16 bit digital input module could be considered to be a compact IO device. It is not structured into separate function groups or modules.

Consumer

The consumer of a connection is a participant in unidirectional communication who receives (“consumes”) data. Within a producer-consumer model, each connection can have one or multiple consumers.

CP

See Communication phase

Cross communication

Communication between participants which are not in a master-slave-relation, for instance between 2 slaves or between 2 masters.

Device Type Manager

The Device Type Manager (DTM) is a software module with graphical user interface for the configuration and/or for diagnosis of devices.

DTM

See Device Type Manager

Drive

A drive is a device according to FSP Drive specification.

Electronic Label

For each SERCOS III device an electronic label holds device-related information. It can be accessed via IDN S-0-1300. The following items may be stored in the electronic label:

- S-0-1300.x.01 Component Name
- S-0-1300.x.02 Vendor Name

- S-0-1300.x.03 Vendor Code
- S-0-1300.x.04 Device Name
- S-0-1300.x.05 Vendor Device ID
- S-0-1300.x.06 Connected to sub-device
- S-0-1300.x.07 Function revision
- S-0-1300.x.08 Hardware Revision
- S-0-1300.x.09 Software Revision
- S-0-1300.x.10 Firmware Loader Revision
- S-0-1300.x.11 Order number
- S-0-1300.x.12 Serial Number
- S-0-1300.x.13 Manufacturing Date
- S-0-1300.x.14 QS Date
- S-0-1300.x.20 Operational Hours
- S-0-1300.x.21 Service Date
- S-0-1300.x.22 Calibration Date
- S-0-1300.x.23 Calibration Due Date

Field Device Tool

FDT specifies an interface, in order to be able to use DTM (Device Type Manager) in different applications of different manufacturers.

FDT

See Field Device Tool

FSP Drive

A specification for mechanical drives to be controlled by SERCOS III, see reference [8].

FSP IO

A specification for IO Devices to be controlled by SERCOS III, see reference [7].

Function Group

A function group combines related functions of a module within a modular IO Device. For instance, all digital input channels of a specific module would set up a function group "*Digital Inputs*" for that module.

Hybrid IO Device

A hybrid IO device combines an IO device (compact or modular IO Device) with a drive.

IDN

An IDN is a unique identification number for a parameter or procedure command within SERCOS III. For a list of generally applicable IDNs see reference [5].

IO Device

An IO Device is a SERCOS III device according to the FSP IO specification (reference [7])

In SERCOS III there are three kinds of IO devices defined, see there:

- Compact IO Devices
- Modular IO Devices
- Hybrid IO Devices

Master

SERCOS III Master devices initiate the data traffic on the bus. In the SERCOS III protocol Master devices are called active participants. A master may send messages without external request.

Modular IO Device

A modular IO device contains a complex or variable configurable device which is structured into separate modules. For these modules, there are separate function groups defined.

PDIN

This is an area in which process data input is stored.

PDOUT

This is an area in which process data output is stored.

Procedure Command

Some IDNs do not store values, but are connected to an action (the execution of a command). These are denominated as command procedures.

Producer

The producer of a connection is a participant in unidirectional communication who sends (“produces”) data. Within a producer-consumer model, each connection can have only one unique producer.

SDDML

SDDML = SERCOS III Device Description Markup Language

The device description file describes the technical characterics of a device type in an exactly defined format. SDDML descriptions are generated by the device manufacturer individually for each device type and provided to the user as SDDML files.

As the file format is standardized, the projecting system can easily access the description and take these data into account during system configuration.

SERCOS address

A SERCOS address is a numerical value in the range between 0 and 127, which is used for unique identification of a device within the SERCOS III network.

Slave

Slave devices are peripheral devices, like for example I/O devices or drives. Slave devices are also called passive participants. They do not receive the bus access authorization. That means, they may only accept received messages from the Master or send a message to the Master after enquiry of the Master.

Structure Element

A structure instance may be divided in one or multiple structure elements.

Structure Instance

An IDN may be divided in one or multiple structure instances. Each structure instance may contain one or multiple structure elements

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